

THE RELATIONSHIP OF SELF-CONCEPT OF ACADEMIC ABILITY  
TO ACADEMIC ACHIEVEMENT FOR GRADE EIGHT STUDENTS  
IN SIX RURAL SCHOOLS OF FERRYLAND DISTRICT

CENTRE FOR NEWFOUNDLAND STUDIES

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THE RELATIONSHIP OF SELF-CONCEPT OF ACADEMIC ABILITY  
TO ACADEMIC ACHIEVEMENT FOR GRADE EIGHT STUDENTS  
IN SIX RURAL SCHOOLS OF FERRYLAND DISTRICT

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A Thesis  
Presented to  
the Faculty of Graduate Studies  
Memorial University of Newfoundland

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In Partial Fulfillment  
of the Requirements for the Degree  
Master of Education

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by  
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August, 1972

MEMORIAL UNIVERSITY OF NEWFOUNDLAND

FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend for acceptance, a thesis entitled "The Relationship of Self-Concept of Academic Ability to Academic Achievement for Grade Eight Students in Six Rural Schools of Ferryland District" submitted by Catherine O'Brien, B. N., in partial fulfillment of the requirements for the degree of Master of Education.

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## ACKNOWLEDGEMENTS

The writer thanks the many people who helped in the completion of this thesis, particularly Mr. J. Kinsella, M. Ed., Superintendent and Mr. Frank Smith, M. A., Supervisor of the schools under the jurisdiction of the Roman Catholic School Board in Ferryland District. The excellent co-operation of principals, teachers and students is gratefully acknowledged.

Special thanks are due to Dr. William Spain for his assistance and criticism, and to Sister Mary Perpetua Kennedy, Ph. D. for her guidance and advice throughout the research. Appreciation is also extended to the internal and external readers for the contribution of their valuable time and personal interest in the study.



## ABSTRACT

This study examined the relationship between students' self-concepts of academic ability and achievement. More specifically, it investigated the differences in academic self-concept in students with similar levels of intelligence but with different levels of achievement. The study was designed to determine whether or not self-concept of ability was a significant factor in the achievement of junior high school students, and whether or not self-concept of ability functioned independently of measured intelligence in predicting school achievement. It attempted to identify the "significant others" related to school achievement, and it investigated the relationship between a student's academic self-concept and his educational expectations. The relationship between self-concept of ability and best and least liked subjects was also explored.

The sample used in the study consisted of 193 students of whom 97 were boys and 96 were girls. This number represented almost the total enrollment of Grade VIII pupils in Ferryland District which is a rural area on Newfoundland's south-east coast.

Data were collected during May and June, 1971, by means of a questionnaire, a standardized intelligence test, self-concept scales, and school records.

Descriptive and statistical analyses were made of the data collected. The statistical procedures used to test the hypotheses included the t test and Pearson product moment correlation. Partial Pearson product moment correlations were also used.

The major findings of the study revealed that self-concept of ability was significantly related to achievement when measured intelligence is controlled. Significant differences in the mean self-concept of ability scores of over- and under-achievers were found at all intelligence levels. Differences in the self-concept scores of boys and girls were significant only at low intelligence levels.

Parents were named by more than 99 percent of students as concerned with their school work, while teachers were mentioned by 78 percent. The mean self-concept of ability score of students who expected to attend college was significantly higher than the mean score of those who expected to complete high school. The mean self-concept of ability score was significantly higher in whatever subject the student liked best than it was in the one the student liked least.

These findings suggest the need for parents, teachers, and school counsellors to become more aware of the fact that a student's academic self-concept is closely related to his academic achievement. His performance depends not only on how intelligent the student actually is, but also on how intelligent he thinks he is. Counsellors and teachers, when devising or implementing new programs, should take the



developmental approach to education. They should concern themselves with the prevention of negative self-concepts of ability in the formative years of students through early recognition and remediation of academic deficits. A measure of success should be afforded each student, for in terms of his future education and potential a sense of confidence and assurance is an important asset. With it the child can achieve much. Without it he will be handicapped despite the presence of even above average academic ability.



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## CHAPTER I

### THE PROBLEM

Our schools have many students who are not making the desired response to the process of schooling. The large number of physical and psychological dropouts from school presents a very real problem to educators as well as the community in which they live. This concern is generated mainly because of the lowered opportunities which await those unprepared to work in a technical society.

Research into the problem of dropouts and achievement has been focused chiefly in four areas: 1) innate abilities; 2) the socioeconomic family conditions; 3) the process of schooling itself; and 4) the self-concept or educational aspirations.<sup>1</sup> While these four kinds of elements can be considered as interrelated, this study will investigate specifically educational self-concept and achievement.

Many variables have been investigated in the attempt to find non-intellectual correlates of academic success. The question posed by this study is whether a student's scholastic success or failure is reflected in his concept of himself as a learner. Over two decades ago Lecky suggested that exper-

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<sup>1</sup>R. J. Havinghurst, The Public Schools of Chicago (Chicago: The Board of Education, 1964), p. 33.



ience in primary school established in the student certain beliefs and ideas about his abilities and capabilities. He contended that these beliefs had far reaching effects on the child as a learner.<sup>2</sup>

Fink explored the possible relationship between under-achievement and self-concept. He studied twenty pairs of boys and twenty-four pairs of girls at the grade nine level. They were matched for I.Q.'s in the 90-110 range. One over-achiever and one under-achiever made up each pair. Each individual student was judged an under- or over-achiever depending on whether his grade point average fell below or above the class median. The self-image of students was based on data from three personality tests, a personal data sheet and a student essay. Fink found a strong significant relationship between self-concept and academic under-achievement and further that this relationship was stronger for boys than for girls.<sup>3</sup>

Brookover, Thomas and Paterson studied one thousand seventh grade students and found a statistically significant positive correlation between self-concept and general performance in academic subjects. They also observed that self-concept was significantly and positively related to the

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<sup>2</sup>Prescott Lecky, Self-Consistency: A Theory of Personality (New York: Island Press, 1945), p. 58.

<sup>3</sup>Martin B. Fink, "Self-Concept as it Relates to Academic Achievement," California Journal of Educational Research, XIII (April, 1962), 57-62.

perceived evaluations which "significant others" held of the student.<sup>4</sup>

These studies suggest that a person's self-concept is related to his performance in school. Furthermore, people significant or important to the student can influence his concept of self which in turn can affect his performance in academic areas.

#### PURPOSE OF THE STUDY

The major purpose of this study is to investigate the relationship of self-concept of academic ability to academic achievement in students from a rural area. It also attempts to replicate in part the study of Brookover, Thomas and Paterson where it was found that self-concept of ability functions independently of measured intelligence in predicting school achievement.<sup>5</sup> Several other questions will also be explored:

1. What is the relationship between self-concept of ability and intelligence?
2. Who are the "significant others" in relation to educational achievement?
3. What is the relationship between the self-concept of ability scores in best and least liked subjects?

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<sup>4</sup>W. B. Brookover, S. Thomas, and A. Paterson, "Self-Concept of Ability and Academic Achievement," Sociology of Education, XXXVII (June, 1964), 271-278 (microfilm).

<sup>5</sup>Ibid., pp. 276-278.



4. What are the students' educational aspirations and expectations?

#### NEED AND SIGNIFICANCE OF STUDY

No systematic investigation to the writer's knowledge has been carried out in rural Newfoundland to explore the relationship between self-concept and achievement. Since much emphasis is placed on self-concept at the theoretical level in teacher education, exploratory studies of this nature are needed.

In recent years the attrition rate in Newfoundland schools has received increasing attention from government and educators alike. Attention should be directed to those students who fail to meet their intellectual potential but who have a chance of succeeding in the academic area. The Royal Commission on Education and Youth stated:

Slightly more than 40 percent of the Grade II students of 1952-53 reached Grade XI in 1961. This means that the system as a whole is falling far short of its stated objectives of enabling each human being to achieve his fullest and best development both as a private individual and as a member of human society. Such a waste of human resources is contrary to the best interest of the province.<sup>6</sup>

Low I.Q. scores have relieved both the student and the teacher of any responsibility for poor school achievement. Too long it has been the custom to explain inferior perfor-

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<sup>6</sup>Province of Newfoundland and Labrador, Report of the Royal Commission on Education and Youth, I (St. John's: The Queen's Printer), 38-41.



mance of children in our schools through their poor showing on intelligence tests. Too often the assumption is commonly made that failure in the school is primarily a product of low intelligence and lack of motivation. This is especially so if the child has lower class status and can fit neatly into such categories as "disadvantaged" or "culturally deprived." Since the turn of the twentieth century the relationship between socioeconomic status and achievement has been the object of much research. Studies such as those conducted by Rossi<sup>7</sup> and Havinghurst and Janke<sup>8</sup> have shown that the failing groups are predominantly members of the lower socioeconomic groups in society. Socioeconomic status as Lavin has pointed out is in fact a derivative or summarizing variable which symbolizes a variety of values, attitudes and motivations related to academic achievement.<sup>9</sup> Little can be achieved in a short time to change socioeconomic status. Since the view that intelligence is in a large part achieved is finding increasing support in psychological research, there is a need to look for other social psychological

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<sup>7</sup>Peter H. Rossi, "Social Factors in Academic Achievements: A Brief Review," Education, Economy and Society, J. H. Halsey, editor (Glencoe: The Free Press, Inc., 1961), 269-272.

<sup>8</sup>R. Havinghurst and Leota Lang Janke, "Relation Between Ability and Social Status in a Midwestern Community," The Journal of Educational Psychology, XXXVI (November, 1945), 499-509 (microfilm).

<sup>9</sup>D. E. Lavin, The Prediction of Academic Performance (New York: Russell Sage Foundation, 1965), p. 123.

variables which hinder academic achievement.<sup>10</sup> Lavin has also stated that measures of ability on the average account for only 35-45 percent of the variation in academic performance. More than half the variation remains unexplained.<sup>11</sup> There is then a need to look for non-intellective factors related to academic achievement. The need is particularly significant at the lower level of education where corrective measures could be introduced.

If indeed it can be shown that self-concept of ability is related to academic achievement, perhaps further research will show that achievement may be enhanced if self-concept of ability of the student is improved through modification of the images and expectations which others hold for him.

A child attempts to respond to the shaping behaviour of others by conforming to their expectations, and in later life may never feel the need to re-evaluate his attitudes. There is universal recognition that patterns of behaviour which begin in early childhood are sustained and developed in later education. Self-concept of academic ability may be explained as a function of this shaping or press. That such presses exist in the school setting is unquestionable. The expectations of teachers, their differential biases, their methods of reinforcing student responses and the influence of

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<sup>10</sup>Joseph McVicker Hunt, Intelligence and Experience (New York: Ronald Press, 1961), pp. 344-346.

<sup>11</sup>Lavin, op. cit., p. 59.



parents and peers directly or indirectly shape the behavioural responses of children. Hamachek states:

Many different experiences ultimately influence how an individual feels about himself. What happens to a youngster as he goes through school must certainly rank as one of the most important experiences in his life. Depending upon what occurs in school a child learns that he is able or unable, adequate or inadequate. The self is learned and what is learned can be taught. The question is not whether the effects of schooling are positive or negative. For the young student particularly, school is not so much a vestibule to society as we adults picture it. For him it is society. As such, its effects are enormously far reaching. How he does is related to how he thinks he can do, and schools play a considerable part in shaping the direction of that attitude.<sup>12</sup>

This idea, together with a statement made by Glasser that "the major problem of the schools is a problem of failure,"<sup>13</sup> leads the writer to believe that an investigation of the relationship between self-concept of ability and achievement in a rural area would be both interesting and profitable.

#### HYPOTHESES

1. There is no significant relationship between pupils' self-concept of ability scores and their achievement scores.
2. There is no significant difference in the mean self-concept of ability scores of boys and girls with similar levels of intelligence.

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<sup>12</sup>Don E. Hamachek, Encounters with the Self (New York: Holt, Rinehart and Winston, Inc., 1971), p. 219.

<sup>13</sup>William Glasser, M.D., Schools without Failure (New York: Harper and Rowe, 1967), p. 77.



3. There is no significant difference in the mean self-concept of ability scores of over-achievers and under-achievers with similar levels of intelligence.

The statistical procedures used to test these hypotheses are given in Chapter III.

## OPERATIONAL DEFINITIONS

This section contains a brief description of the variables used in the study and their operational definitions.

### Achievement or Academic Performance

As traditionally used, the terms refer to some method of expressing a student's scholastic status. Usually this is a grade for a course or an average for all courses expressed on a quantitative scale. In this study achievement will be defined as the average percentage score obtained in the following subjects: English language, English literature, history and geography, mathematics, science, and French. Achievement in specific school subjects will be the final percentage score obtained in each of the subjects mentioned above, on teacher-made tests.

### Predicted Grade

A value computed from a regression equation between aptitude and obtained grades of the student studied.

### Achievers

Those students whose performance levels fall within

one standard error of prediction above or below their predicted grade.

#### Over-Achievers

Those students whose levels of performance fall one standard error of prediction above their predicted grade.

#### Under-Achievers

Those students whose levels of performance fall one standard error of prediction below their predicted grade.

#### Intelligence Score

The score obtained by each student on the Canadian Lorge-Thorndike Intelligence Tests, Form 1, Level E, Verbal Battery.

#### Rural

All communities whose population falls at or below one thousand, or are designated "rural areas" by the Provincial Government of Newfoundland.

#### Self-Concept of Ability

Previously cited research has shown this concept to be based on the observation that children learn what they believe they are able to learn. Particularly relevant to the educational process is the inference that the individual acquires conceptions of his ability to learn through interaction with others whose evaluations are important to him.



### General Self-Concept of Ability Score

The score obtained on the Self-Concept of Ability Scale, Form A, General, College of Education, Michigan State University.

### Specific Self-Concept of Ability Score

The score obtained on the Specific Self-Concept of Ability Scale, College of Education, Michigan State University.

### Significant Others

Those real or imaginary persons who influence the individual's beliefs about himself and his world.

### Socioeconomic Status

The occupation of the child's father or guardian was obtained from school records. The Blishen Occupational Class Scale was used to transform occupation into socioeconomic status. A copy of this scale is contained in Appendix E.

## LIMITATIONS

Students from only one rural area of Newfoundland and from one specific grade were investigated in this study. No attempt was made to investigate environmental factors associated with the student's background other than socioeconomic status. No attempt was made to establish a cause-and-effect relationship between self-concept of academic ability and achievement. Variations in teacher qualifications and methods of assigning grades were not controlled. Achievement



groups were chosen on the basis of only one set of I.Q. scores. Any interpretation of the results must be undertaken with these limitations in mind.

#### ORGANIZATION OF THE REPORT

Chapter II presents the theoretical orientation of the study and the related research. An outline of the procedures followed in conducting the study and a description of the methods used to collect and process the data are contained in Chapter III. Chapter IV reports the statistical testing of the basic hypotheses and the findings of this investigation. The final chapter gives a summary of the study, some conclusions and several recommendations for further research.

## CHAPTER II

### REVIEW OF THE LITERATURE

This chapter is divided into two sections. The first section discusses the theoretical orientations of the study, while the second section reports the findings of related research.

#### THEORETICAL ORIENTATION

The theoretical orientation on which this study is based is commonly identified as the symbolic interaction theory of behaviour. C. A. Cooley was one of the earliest social psychologists to explore the idea of self. He believed that the social milieu from which a person comes plays a significant role in determining how a person views himself. He was concerned primarily with the development of self as a consequence of interpersonal relationships. In this connection Cooley advanced the concept of the "looking glass self" -- we see ourselves in the way we perceive others see us. He suggests that in the development of his self-conceptions the individual is constantly engaged in the process of looking at himself and evaluating his behaviour through the eyes of the others with whom he interacts.<sup>1</sup>

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<sup>1</sup>C. A. Cooley, Human Nature and Social Order (New York: Charles Scribner's Sons, 1902), pp. 20-21.



George H. Mead described how the self is developed through transaction with the environment. He argues that personality is largely determined by social psychological factors rather than biological variables. Mead's self is a social self derived from the interaction between the individual and his social world. A person comes to know himself and responds to himself as he sees others responding to him. He suggested that a person may have as many selves as the roles he plays and the social groups in which he participates.<sup>2</sup>

The theoretical position of Sullivan is related to the social interaction theories of Mead and Cooley. He believed that the child developed expectations and attitudes towards himself through the interpersonal relationship which he experiences from the earliest months of life. A central concept in Sullivan's system is that of "consensual validation" by which he means the manner in which meanings of symbols and the validity of ideas, including ideas about the self, are developed and confirmed in the process of communicating with others.<sup>3</sup> The individual's behaviour can be understood only when it is related to the groups of which he is a member, the social roles in which he engages and his interactions with significant others, the persons whose appraisal he values. These reflected appraisals play a profound role in developing

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<sup>2</sup>George H. Mead, Mind, Self and Society (Chicago: University of Chicago Press, 1934), p. 48.

<sup>3</sup>H. S. Sullivan, "The Illusion of Personal Individuality," Psychiatry, XIII (May, 1950), 317-332.



the individual's self image.<sup>4</sup>

Syngg and Combs proposed that the basic drive of the individual is the maintenance and enhancement of self. They contend that the social behaviour of an individual is consistent with his perceptual field. They define perceptual or phenomenal field as the universe of experience open to the individual at any given moment. Reality is the individual's perception of an event rather than the event itself. It is not the event which elicits a response but rather the individual's subjective experience or personal meanings of the event. The self-concept develops during the growing-up process through contacts and experience with "significant others." It is both a product of the individual's experience and a producer of new experience which is perceived in terms of its relevance to the self. Syngg and Combs believed that the maintenance and enhancement of the self is the motive behind all behaviour. The self-concept determines the kind and quality of an individual's experience and affords a unique way of viewing one's relationship to one's environment.<sup>5</sup>

Kinch defined the self-concept as that organization of qualities that the individual attributes to himself. The individual's conception of himself emerges from social inter-

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<sup>4</sup>H. S. Sullivan, The Interpersonal Theory of Psychiatry (New York: W. W. Norton and Company, Inc., 1953), p. 169.

<sup>5</sup>D. Syngg and A. W. Combs, Individual Behaviour (New York: Harper and Rowe Publishers, 1949), p. 15.

action and in turn guides or influences the behaviour of the individual. The basic postulates of Kinch's formalized theory are:

1. The individual's self-concept is based on his perceptions of the way others are responding to him.
2. The individual's self-concept functions to direct his behaviour.
3. The individual's perception of the responses of others toward him reflects the actual responses of others toward him.<sup>6</sup>

Brookover and Erickson suggest that educators and psychologists speak of self-concept as if it were a unitary phenomenon, a trait which is generally applicable to rather disparate social situations. It is not uncommon to hear teachers speak of a student's high or low self-concept as if he held only one.<sup>7</sup> Mead pointed out that one has as many self-concepts as roles. A person may have many self-concepts and no single summarizing statement of an individual's self is appropriate. Certain of these self-concepts will be more or less relevant depending on the social situation.<sup>8</sup>

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<sup>6</sup>John W. Kinch, "A Formalized Theory of the Self Concept," American Journal of Sociology, LCVIII (June, 1963), 481-486.

<sup>7</sup>W. B. Brookover, E. L. Erickson, and L. M. Joiner, Self-Concept and School Achievement, III, Co-operative Research Project #2831 (East Lansing: Michigan State University, 1967), p. 10.

<sup>8</sup>Mead, loc. cit.



Rogers' self-theory and ideas about the fully functioning individual represent a synthesis of the phenomenological and social interaction theories. Rogers views the self as a social product developing out of interpersonal relationship. Through interaction with "significant others," self-experience leads to an awareness of self, and with this awareness of self there develops a need for positive regard from others. In Rogers' view the self is the central aspect of personality. It is a pattern of conscious perceptions experienced by the individual which is of central importance to that individual's behaviour and adjustment. He believes that man is basically rational, realistic, co-operative and trustworthy. He suggests there is in every human being a tendency toward self-actualization and growth as long as the environment permits it.<sup>9</sup>

In discussing the circular effect of a child's self-concept of inability to read, Combs states:

Such a child is likely to avoid reading, and thus the very experience which might change his concept of self is bypassed. Worse still, the child who believes himself unable to read, confronted with the necessity for reading, is more likely than not to do badly. The external evaluation of his teachers and fellow pupils, as well as his own observations of his performance, all provide proof to the child of how right he was in the first place! The possession of a particular concept of self tends to produce behaviour that corroborates the

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<sup>9</sup>Carl Rogers, Client Centered Therapy: Its Current Practice, Implications, and Theory (Boston: Houghton Mifflin Company, 1951), pp. 20-22.



self-concept with which the behaviour originated.<sup>10</sup>

The basic hypothesis from these theoretical orientations is that the child learns what he perceives he is able to learn. These perceptions develop through interaction with "significant others" who hold expectations of the child as a learner. Negative perceptions of one's ability to learn appear to be self-fulfilling prophecies.

#### RELATED RESEARCH

The relationship between self-concept and behaviour has been the subject of much research in recent years. Wylie presented a comprehensive review of basic research completed before 1960. She was pessimistic over the general quality of much self-concept work up to that time. Many of the studies she reviewed proved to be those of self-report which varied considerably in design and the variables measured. Other criticisms of self-concept research arise because the approach and research designs are too broad. The global approach causes difficulty in assessing each factor independently.<sup>11</sup>

LaBenne and Greene suggested that much confusion in self-concept research is due to the fact that the researcher

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<sup>10</sup>A. W. Combs, "Intelligence from a Perceptual Point of View," Journal of Abnormal and Social Psychology, XLVII (April, 1952), 669-670.

<sup>11</sup>R. Wylie, The Self Concept (Lincoln, Nebraska: University of Nebraska Press, 1961), pp. 114-119.

develops his own instruments to test his theories. Often these instruments were not checked for validity and reliability and cannot be located when other researchers wish to replicate the studies.<sup>12</sup> Brookover, Erickson and Joiner noted that many of the studies are entirely different; the only similarity between one study and another is the use of the term "self-concept."<sup>13</sup>

Combs and Soper argued that self-report and self-concept are not identical. They believed that while the self-concept is what an individual believes about himself, the self-report is only what he is willing and able to disclose to someone else. They say:

The 'self-concept' as it is generally defined is the organization of all that seems to the individual to be 'I' or 'me.' It is what an individual believes about himself; the totality of his ways of seeing himself. On the other hand, the self-report is a description of self reported to an outsider. It represents what the individual says he is. To be sure what an individual says of himself will be affected by his self-concept. This relationship, however, is not a one to one relationship.<sup>14</sup>

Rogers has taken the opposite position that self-reports are valuable sources of information. He feels that

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<sup>12</sup>Wallace D. LaBenne and Berl I. Greene, Educational Implications of Self-Concept Theory (Pacific Palisades, California: Goodyear Publishing Company, Inc., 1969), p. 110.

<sup>13</sup>W. B. Brookover, E. L. Erickson, and L. M. Joiner, Self-Concept and School Achievement, III, Co-operative Research Project #2831 (East Lansing: Michigan State University, 1967), p. 12.

<sup>14</sup>A. W. Combs and D. W. Soper, "The Self, Its Derivative Terms and Research," Journal of Individual Psychology, XIII (March, 1957), 494.



if one wants to know more about a person one should ask him directly.<sup>15</sup> Gordon suggested that there is no point to any argument over what a person's real self-concept is, since one must rely on operational definitions in any case. He argued that truthfulness and meaningfulness are more important than objective reality, and therefore any technique must be based on the expectation that the subject will answer truthfully.<sup>16</sup>

Few of the studies reviewed by Wylie were concerned with self-concept and achievement. None were concerned specifically with that aspect of self related to one's concept of his ability in academic areas. Stevens found that high achievers showed a greater positive attitude towards themselves than did low achievers. However, in Stevens' study the high and low achievers could have differed considerably in intelligence.<sup>17</sup> Reeder investigated the relationship between self-esteem and grades in elementary school children. His research indicated that students with low self-esteem have lower grades than students with higher self-esteem.<sup>18</sup>

Walsh investigated under-achievement in twenty

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<sup>15</sup>Rogers, op. cit., p. 494.

<sup>16</sup>I. J. Gordon, Studying the Child in the School (New York: John Wiley and Sons, Inc., 1966), p. 54.

<sup>17</sup>Peter H. Stevens, "An Investigation of the Relationship Between Certain Aspects of Self-Concept Behaviour and Students' Academic Achievement," Dissertation Abstracts, XVI (December, 1956), 193-196.

<sup>18</sup>T. A. Reeder, "A Study of Some Relationships Between Self-Concept, Academic Achievement and Classroom Adjustment," Dissertation Abstracts, XV (December, 1955), 2472.



elementary school boys who were matched with twenty other boys who had similar I.Q.'s. She found that bright boys who were low achievers had more negative feelings about themselves than did high achievers.<sup>19</sup>

Another study investigated the relationship between self-concept and achievement in freshmen who came voluntarily to a college reading program. The findings indicated that not only is self-concept related to achievement, but that, in terms of their conception of self, individuals have a definite interest to perform as they do. Other findings such as changes in self-concept and grade point average indicated further support for the theory that those who succeed as well as those who do not, do so as a result of the needs of their own self-system. Roth states: "With all things being equal, those who do not achieve choose not to do so, while those who achieve choose to do so."<sup>20</sup>

One investigation showed that under-achievement for boys can begin as early as the first grade and is definitely present by the third grade. For girls, the problem existed as early as the sixth grade. The problem is of increasing importance for both boys and girls from grades nine to

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<sup>19</sup>Ann M. Walsh, Self-Concepts of Bright Boys with Learning Difficulties (New York: Teachers College Press, Columbia University, 1956), pp. 110-115.

<sup>20</sup>R. M. Roth, "The Self-Concept as a Factor in Over and Under Achievement," Journal of Experimental Education, XXVII (May, 1959), 281.

eleven.<sup>21</sup> These findings were supported by Wattenberg and Clifford who studied the relationship of kindergarten children's self-attitudes to later school achievement in elementary schools. They studied two groups of kindergarten pupils in two separate schools, one in a middle-class section of the city and the other serving a lower-class area. They measured reading ability, self-concept and intelligence at the beginning of kindergarten and again at the third grade level. They found that the self-attitudes of the student were a better indicator of his subsequent reading skills than his intelligence.<sup>22</sup>

Nash, in studying the self-perceptions of junior high school students, developed a set of one hundred items. He found that the items found to be best in differentiating between high and low achievers were those concerned with the student's perception of the calibre of his performance in school work such as, "My grades are good" and "I am accurate in my school work."<sup>23</sup>

A study by Combs investigated two groups of academically capable boys in grade eleven. Each student had an

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<sup>21</sup>M. C. Shaw and J. T. McCuen, "The Onset of Academic Under-Achievement in Bright Children," Journal of Educational Psychology, LI (November, 1960), 103-108.

<sup>22</sup>W. W. Wattenberg and C. Clifford, "Relations of Self-Concepts to Beginning Achievement in Reading," Child Development, XXXV (June, 1964), 461-467.

<sup>23</sup>Ralph J. Nash, "A Study of Particular Self-Perceptions as Related to High School Age Pupils in a Middle Class Community," Dissertation Abstracts, XXIV (March, 1964), 3837-3838.



I.Q. of 115 or over. Achievers were defined as those students with a cumulative grade point average above the fiftieth percentile. Under-achievers were those whose cumulative grade point average fell below the twenty-fifth percentile. His findings suggested that significant differences existed between these two groups in their perceptions of self and others. The under-achievers not only saw themselves as less adequate and less acceptable, but also saw peers and adults as less acceptable.<sup>24</sup>

Haarer tested the hypothesis that a learner's self-concept of ability is a functionally limiting or facilitating factor in classroom achievement. The main research instrument was the Michigan State Self-Concept of Ability Scale developed by Brookover and others. Correlational analysis and t test were the main statistical techniques. The major results of this investigation showed that self-concept of ability is significantly related to classroom achievement of delinquent and non-delinquent ninth grade male students when the effects of measured intelligence is controlled. I.Q. alone is not a reliable predictor of classroom achievement for ninth grade boys. Expectations of "significant others" as perceived by both delinquent and non-delinquent boys are positively related with the students' self-concepts as

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<sup>24</sup>Charles F. Combs, "Self-Perception and Scholastic Underachievement in the Academically Capable," The Personnel and Guidance Journal, XXXIV (December, 1963), 401-403.



learners and with their classroom achievement.<sup>25</sup>

Dyson studied five hundred and sixty-seven seventh grade students to investigate the interrelationships among acceptance of self, academic self-concept and two types of grouping procedures used to classify seventh grade students for instruction. Two schools were studied, one in which the students were grouped homogeneously, and another in which students were grouped heterogeneously. The patterns obtained when academic self-concept reports are compared with how children are grouped do vary significantly from those to be expected in a random distribution. There were no significant differences between boys and girls on these patterns. Those who earn higher grades report significantly more positive academic self-concepts, while those who earn poor grades report less positive self-concepts. This was true regardless of the type of grouping reported in the school.<sup>26</sup>

Caplin investigated the relationship between academic achievement, self-concept and levels of aspiration in children attending a de facto segregated school and those attending a desegregated one. From self-report instruments administered, scores were obtained measuring self-concept and level of

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<sup>25</sup>D. L. Haarer, "A Comparative Study of Self-Concept of Ability Between Institutionalized Delinquent Boys and Non-Delinquent Boys Enrolled in Public School," Dissertation Abstracts, XXV (May, 1965), 6410.

<sup>26</sup>Ernest Dyson, "A Study of Ability Grouping in the Self-Concept," The Journal of Educational Research, LX (May, 1967), 403-405.

aspiration. Correlations between the scores on self-concept level of aspiration instrument and the Iowa Test of Basic Skills were then calculated. It was found that children attending the de facto segregated school had less positive self-concepts than those attending the desegregated schools. There was a significant positive relationship between self-concept and academic achievement and between level of aspiration and academic achievement. That is, those children having more positive self-concepts and/or higher levels of aspiration had higher academic achievement.<sup>27</sup>

The relationship between self-concept and school achievement for fourth, fifth, and sixth grade public school children was examined by Campbell. The data supported the hypothesis that there is a direct linear relationship between self-concept and school achievement in the fourth, fifth, and sixth grades. He found that this relationship is more pronounced for boys than girls and that girls have a higher self-concept specific to the school setting than boys. The data did not support the non-linear effect of ability level groupings. The correlations were not high enough to be useful in predicting achievement from self-concept and achievement. In some students, a change in self-concept took place over a period of one year. Low self-esteem and high academic achievement were associated with maladjustment as

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<sup>27</sup>M. D. Caplin, "Self-Concept and Academic Achievement," Dissertation Abstracts, XXVII (September, 1966), 979.



were also high self-esteem and low achievement.<sup>28</sup>

A study by Peters was designed to show whether there was a relationship between self-concept and over- and under-achievement as determined by discrepancies between predicted grade point average and actual achievement. She concluded that total self-concept as measured by the Tennessee Self-Concept Scale was not significantly related to over- and under-achievement.<sup>29</sup>

In an effort to determine students' perceptions of self, school and student-teacher relationship, Hamachek and Conley studied 1200 students in grades six through twelve. When sex and grades were taken into account, some interesting differences in perception were found. The major findings were as follows: 1) Girls receive consistently higher grades than boys from grade six through twelve; 2) Girls have generally a more positive attitude towards school and themselves than boys; and 3) Negative perceptions about school, self and teachers increase as boys progress from grade six to twelve, while the girls' perceptions become increasingly more positive.<sup>30</sup>

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<sup>28</sup>Paul B. Campbell, "Self-Concept and Academic Achievement in Middle Grade Public School Children," Dissertation Abstracts, XXVII (November, 1966), 1535-1536.

<sup>29</sup>D. M. Peters, "The Self-Concept as a Factor in Over and Underachievement," Dissertation Abstracts, XXIX (November, 1966), 1792.

<sup>30</sup>Don E. Hamachek and J. Conley, "An Exploratory Study of Students' Perceptions of Schools, Teachers, Skills, Self and Student Teaching Relationship in Grades Six Through Twelve" (a paper presented at the American Educational Research Association Convention, February 10, 1968, Chicago).



A series of studies initiated by Brookover concerned with the self-concept and educational achievement are now underway. These researchers are following the progress of a particular group of students over a period of years and noting changes in self-concept and performance. The studies concentrate on the student's academic self-concept and its relationship to sex, social class and school attended. At first, they wished to determine if these variables should be controlled in subsequent analyses. These analyses were based on 1050 seventh grade students in four junior high schools. They found that the mean self-concept of ability score for all girls is significantly higher than that for boys. Each of the higher social class groups had a significantly higher mean self-concept of ability score than the next lower group. Results also showed that high achieving students had significantly higher self-concept of ability scores than low achieving students with comparable measured intelligence ranges. They found that a student's self-image may be a composite of the images reflected by many persons who are important to him. The images of peers are less related to self-concept than those of parents and teachers. The mother was seen as the major figure in the lives of most of the students. This research indicated that self-concept of ability functions independently of measured intelligence in predicting school achievement.<sup>31</sup>

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<sup>31</sup>W. B. Brookover, S. Thomas and A. Paterson, "Self-Concept of Ability and Academic Achievement," Sociology of Education, XXXVII (June, 1964), 271-278.

In the second phase of this study, which investigated the same students, Brookover and his associates found that self-concept of ability was a significant factor in achievement from grade seven through tenth grade.<sup>32</sup> In the final phase of the investigation which followed the same students from grade seven to eleven, the authors made the following observation:

The correlation between self-concept of ability and grade point average ranges from .48 to .63 over the six years. It falls below .50 only among boys in the 12th grade. . . . In addition, the higher correlation between perceived evaluations and self-concepts tends to support the theory that perceived evaluations are a necessary and sufficient condition for (the growth of a positive or high) self-concept of ability, but (a positive) self-concept of ability is only a necessary, but not sufficient condition for achievement. The latter is further supported by the analysis of the achievement of students with high and low self-concept of ability. This revealed that although a significant proportion of students with high self-concepts of ability achieved at a relatively lower level, practically none of the students with lower (less positive) self-concepts of ability achieved at a high level.<sup>33</sup>

In recent years the influence of child rearing practices and the attitudes of parents and teachers on a child's achievement in school are receiving increasing attention. Studies have documented how the lack of suffi-

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<sup>32</sup>W. B. Brookover et al., Self-Concept of Ability and School Achievement, II, Final Report of Co-operative Research Project #1636, U. S. Office of Education (East Lansing: Bureau of Educational Research Services, Michigan State University, 1965).

<sup>33</sup>W. B. Brookover, L. M. Joiner and E. L. Erickson, Self-Concept of Ability and School Achievement, III, Final Report of Co-operative Research Project #2831, U. S. Office of Education (East Lansing: Human Learning Research Institute, Michigan State University, 1967), pp. 142-143.



cient nurture and acceptance by parents may lead to the development of low self-esteem. Roth and Meyersburg describe the etiology of under-achievement in this way:

The psychogenesis involves a series of very subtle devaluations of the child, stemming from the parent-child relationship. In our experience, the most frequent pattern is that of the parent who pays no attention at all to the accomplishments or failures of the child. (These students frequently exclaim, 'What's the use, nobody gives a damn,' in reference to their current college failure.) The life space of the child and the life space of the parent are in different realms, a state of affairs which constitutes a parental rejection. The only way a child can bring the life spaces together, albeit momentarily, is through occasionally necessitating outsiders such as police, teacher, principal, or a counselor.

Next in frequency is the parent who attends only to the child's failures and rarely to his successes. The latter are taken for granted, but the failures are punished. Thus, the contact between parent and child is through failure. If the child succeeds, he is alone, but if he fails, he is part of the concern of his parents.

Both of these early experiences lead to three devastating, incipient pathological processes: the first of these is a process of self-denigration. In order for the child to maintain some kind of identity with the parent he must learn to see himself for his lacks. Hostility, he is taught, is received by him and never expressed toward others. When he does experience resentments he directs them against himself and thus supports his own constructs about himself as being worth little.<sup>34</sup>

Helper studied the relationship between parental evaluations of the child and the child's self-evaluations. Data were gathered on 54 children in the eighth and ninth grades. Each child was asked to rate himself as he ordinarily

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<sup>34</sup>R. M. Roth and H. Meyersburg, "The Non-Achievement Syndrome," Personnel and Guidance Journal, XLI (February, 1963), 538.



thought of himself (actual self-concept) and to rate himself as he would most like to be (ideal self-concept). Each parent used the same scale to rate his child on the same two dimensions. The question of primary interest was the degree of correlation between parental evaluations of the child and the child's self-evaluations. The correlations were found to be small but consistently positive. It should be pointed out, however, that the fathers involved were employed in an academic capacity and thus could be considered as representative of only a narrow portion of the socioeconomic field.<sup>35</sup>

An investigation explored the relationship between parents' attitudes and behaviour and their early grade school age children's academic performance. Parents were interviewed individually at the Fels Research Institute. Attitudes towards four achievement areas were assessed. Relationship between children's I.Q.'s and their scholastic achievement test performance were assessed. Intelligence test scores correlated .57 and .59 with reading and arithmetic test scores respectively for the girls and .66 and .50 for the boys. Correlations between I.Q. and their performance were of the same general magnitude found in past research. These data indicate that intelligence is one major factor in children's academic performance but suggest that other factors may be

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<sup>35</sup>M. M. Helper, "Parental Evaluations of Children and Children's Self-Evaluations," Journal of Abnormal and Social Psychology, LVI (June, 1958), 190-194.

influential.<sup>36</sup>

The influence of teacher attitudes and expectations in achievement of pupils has been the subject of some research. There is evidence to suggest that teachers who have a more positive view of others can affect the performance of their students. Davidson and Lang found that boys and girls with positive self-images were more likely to be among those who perceived that their teachers had positive feelings towards them. The more positive the student's perception of his teacher's feelings toward him, the better was his achievement.<sup>37</sup>

Rosenthal and Jacobson have demonstrated that a teacher's expectations of a student's performance have a profound effect on the student's actual response.<sup>38</sup> It suggests that teachers are likely to encourage and reinforce the behaviour they expect in the first place. The major findings of this research and Hamachek's interpretation of it are given below:

For the school as a whole, those children from whom the teachers had been led to expect greater intel-

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<sup>36</sup>V. Crandall et al., "Parents' Attitudes and Behaviours and Grade School Children's Academic Achievement," Journal of Genetic Psychology, CIV (October, 1964), 53-66.

<sup>37</sup>H. H. Davidson and G. Lang, "Children's Perceptions of Their Teacher's Feelings Toward Them Related to Self-Perception, School Achievement and Behaviour," Journal of Experimental Education, XXIX (May, 1960), 107-118.

<sup>38</sup>R. Rosenthal and L. Jacobson, Pygmalion in the Classroom (New York: Holt, Rinehart and Winston, Inc., 1968), pp. 72-97.



lectual gain showed significantly greater gain in I.Q. score than did other children in the school! In fact, the lower the grade level, the greater the I.Q. gain. Apparently, teachers interacted with the 'brighter' children more positively and more favorably and the children responded in kind by showing greater gains in I.Q. Why should there be more change in the lower grades? One reason is that younger children are generally more malleable, less fixed, and more capable of change. A second possibility is that younger elementary school children do not have firmly established reputations which can be passed on from one teacher to the next.<sup>39</sup>

Implicit in this interpretation is Hamachek's belief that the child who sees himself as capable of learning and achieving, who is secure in his sense of worth, will demonstrate this positive self-image in actual performance.<sup>40</sup>

#### SUMMARY

Virtually all the research reviewed led to the conclusion that one's self-concept does affect one's performance and behaviour. More specifically, the studies cited by Combs, Haarer, Campbell, Brookover and others indicate that a student's self-concept is directly related to his achievement in school. The studies by Rosenthal and Jacobson, as well as those by Brookover, Davidson and Lang, and Roth and Meyersburg seem to imply that people, significant or important to another person, can profoundly influence that person's concept of self.

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<sup>39</sup>Don E. Hamachek, Encounters with the Self (New York: Holt, Rinehart and Winston, Inc., 1971), p. 206.

<sup>40</sup>Ibid., p. 218.

## CHAPTER III

### RESEARCH DESIGN

This chapter describes the procedures followed in carrying out the study. Separate sections will deal with the area studied, collection of data, samples, instruments, administering and scoring tests, and data processing.

### BACKGROUND OF THE STUDY

The decision to investigate grade eight pupils in rural Newfoundland was made for the following reasons:

1. Research shows a high percentage of retardation at the grade eight level from rural areas.<sup>1</sup>
2. Few studies in self-concept and achievement at the lower educational levels were found in the research. None were found in Newfoundland.
3. The Brookover studies investigated junior high school students.
4. The data and results from the study of grade eight students would be useful to the school system.

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<sup>1</sup>Province of Newfoundland and Labrador, Report of the Royal Commission on Education and Youth, I (St. John's: The Queen's Printer, 1967), pp. 38-41.



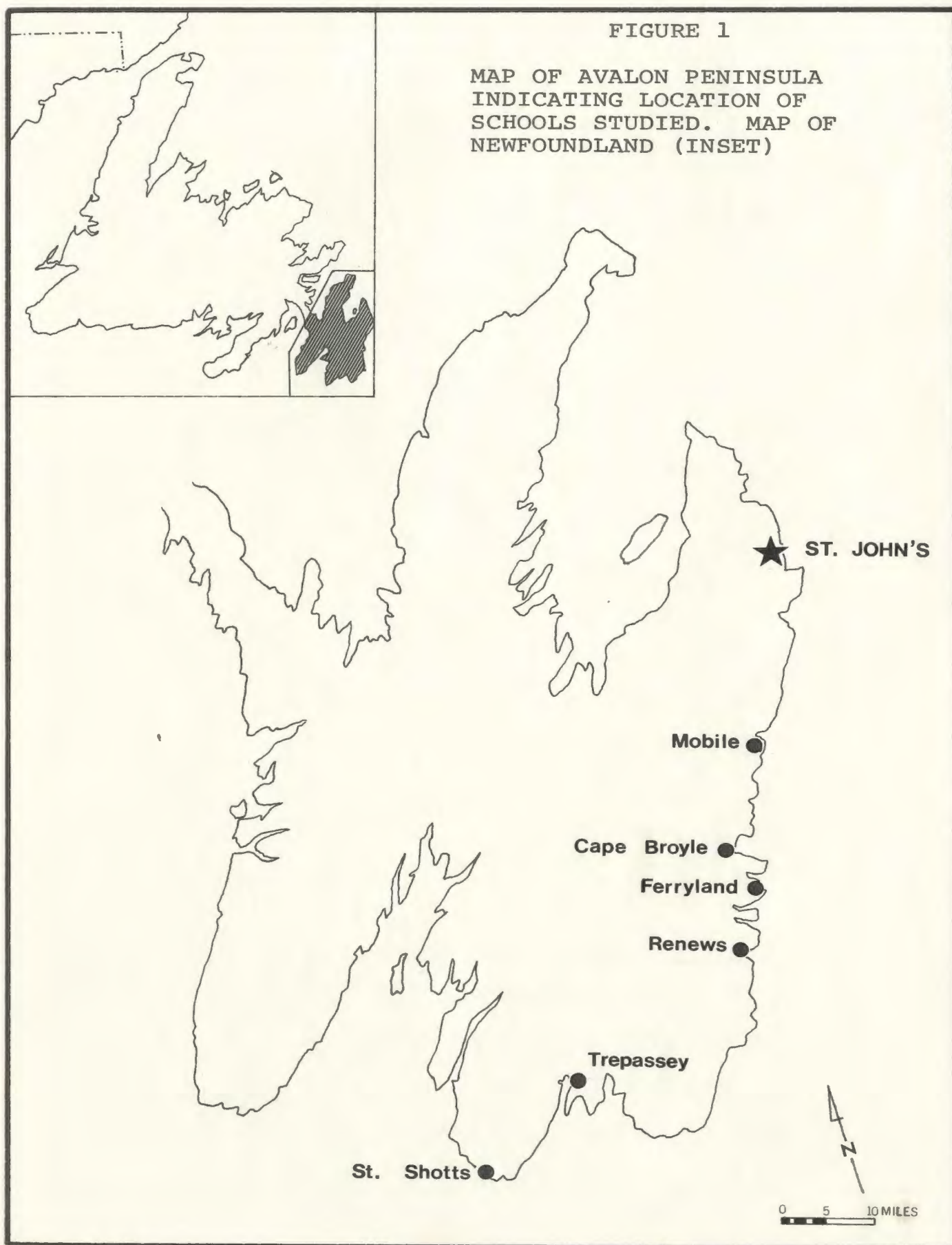
In the selection of area to be studied certain basic requirements were necessary. The area should be fairly representative of rural Newfoundland and be accessible by road. The school population should be large enough to yield statistically significant results. Most importantly, co-operation was needed from the school board, principals and teachers. Ferryland district met these conditions.

#### THE AREA AND SCHOOLS STUDIED

The Southern Shore, Ferryland District, is a rural area on the southeast coast of Newfoundland. The distance from St. John's to St. Shotts is approximately 113 miles. Figure 1 shows a map of the area and the location of the schools studied. In recent years great effort has been made by the Ferryland District School Board to centralize the school system. Presently, there are three high schools which serve students from the small outlying communities. Two schools accept students at the grade seven level and the other at grade nine. Figure 2 presents a flow chart of the three school systems. The total school population is 2,652 pupils.

#### The Mobile System

Mobile Central High School, which serves the area from Bay Bulls to Bauline, admits students from grades seven to eleven. Previously, these pupils attended elementary schools at Bay Bulls, Witless Bay and Tors Cove, all of which have grades kindergarten to six. The schools at Bay Bulls





and Witless Bay have single grade classrooms, while the one at Tors Cove has several multigrade classes.

The high school at Mobile is a new modern building with a gymnasium, library and laboratory facilities. The students have the services of a librarian, a music teacher and a physical education teacher. The 65 grade eight students in this system are all in one school at Mobile Central High. A flow chart of the Mobile System is shown in Figure 2.

#### The Baltimore System

Baltimore High School, located in Ferryland, is similar to the one at Mobile and comparable to it in its facilities and services. Students from Cape Broyle, Ferryland and Renews continue their studies at Baltimore High when they have completed grade eight. The school at Cape Broyle has grades kindergarten to eight inclusive. The communities of Ferryland and Renews both have primary and junior high schools which serve six other communities. Each of the junior high schools has four teachers for two classrooms; thus there is some degree of specialization. The group at Cape Broyle has many multigrade classes.

#### The Stella Maris System

Presently, the Stella Maris System is the least consolidated of those studied. While the high school building in Trepassey, where the majority of grade eight students live, is not as modern as the other two high schools, its services and facilities appear comparable to those in Mobile

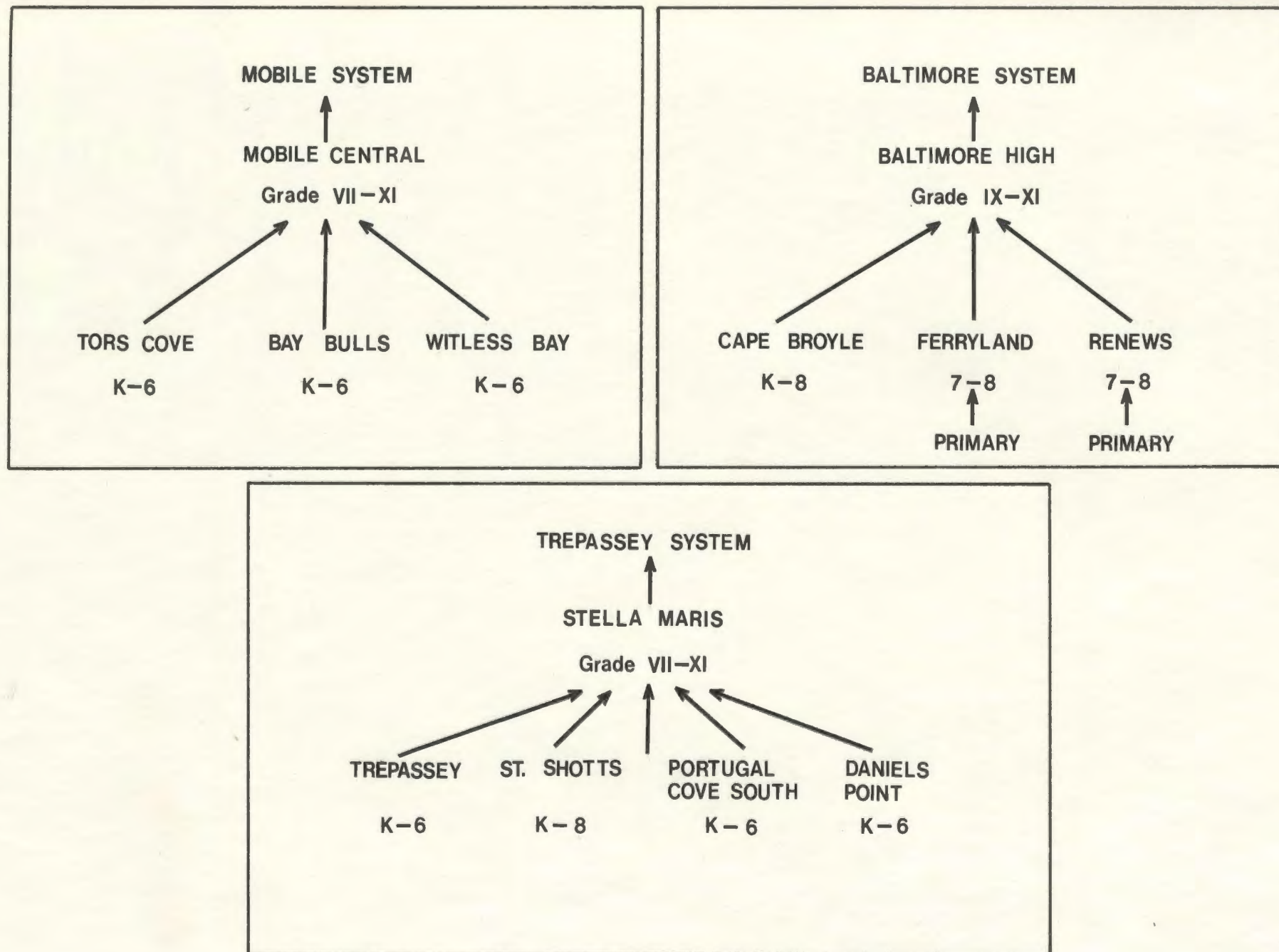


FIGURE 2

FLOW CHART OF FERRYLAND DISTRICT SCHOOL SYSTEMS



and Ferryland. Grade seven level is required for entrance. Of the four outlying schools from which these students come, only one has single grade classes (see Figure 2).

#### COLLECTION OF DATA

In late April, 1971, permission to carry out the study was received from the Superintendent of Schools in Ferryland District. The principals of the schools involved were visited or telephoned to discuss the study and to make arrangements for a tentative testing schedule.

During the months of May and June, 1971, tests and questionnaires were administered to the pupils as shown in Appendix E. The tests were hand scored. The results and the information from the questionnaire were entered on coding forms. The coded information was taken to the Computer Center at Memorial University of Newfoundland for processing in the 1620 I.B.M. computer. A detailed description of the procedure followed is presented below.

#### PUPIL SAMPLE

School records revealed that on May 1, 1971, there were 210 grade eight students located in six different schools. Of this number 111 were boys and 99 were girls. Complete data were obtained on 193 students.

#### INSTRUMENTS

Five instruments were used to obtain the data pre-

sented in this study: a verbal intelligence test, a non-verbal intelligence test, a general self-concept of ability scale, a specific self-concept of ability scale, and a questionnaire.

### Verbal and Non-Verbal Intelligence Tests

The Canadian Lorge-Thorndike Intelligence Tests, Form 1, Level E was used in this study. The Verbal and Non-Verbal I.Q. obtained from this test is a deviation I.Q. designed to have the same mean and standard deviation at each grade level. The odd-even reliability coefficient based on representative single-grade samples for Level E verbal portion is .872 and for the non-verbal portion is .908. The correlation of verbal versus non-verbal raw score is .605.

The statistical validity of the Canadian Lorge-Thorndike Intelligence Tests has not been well established.

The authors state:

Though data for Canadian pupils have not yet been obtained experience with similar forms of the Lorge-Thorndike in the United States indicates that the tests correlate quite highly with other well known measures of intelligence. Correlations of the Verbal Battery with the Stanford Binet and with the WISC Verbal Scale have been reported in the high 70's and low 80's. The Non-Verbal Battery correlated somewhat lower with these same tests in the high 60's and low 70's.<sup>2</sup>

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<sup>2</sup>Irving Lorge, Robert L. Thorndike and Elizabeth Hagan, Canadian Lorge-Thorndike Intellect Test Manual for Administration (Toronto: Thomas Nelson and Sons, Canada Ltd., 1967), p. 29.



### General Self-Concept of Ability Scale

This is a set of eight multiple choice questions devised by Brookover's research staff. Coefficients of reproductibility were .95 for males and .96 for females. These items were coded from 5 to 1 with the higher self-concept alternative receiving higher values. The reliability of the self-concept of ability scale determined by Hoyt's method was .82 for males and .77 for females. Predicted GPA correlated with actual GPA .70 for females and .71 for males.<sup>3</sup> A copy of the General Self-Concept of Ability is given in Appendix A.

### The Specific Self-Concept of Ability Scale

The specific self-concept of ability scales were constructed from the General Self-Concept of Ability Scale and scored by the same method. The highest possible score on both scales is 40. A copy of the Specific Self-Concept Scale is given in Appendix B.

### The Questionnaire

All grade eight students were asked the following:

1. To identify "significant others" related to their achievement in school by response to the question: "Who are the people who you feel are

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<sup>3</sup>W. B. Brookover et al., Self-Concept of Ability and School Achievement, Co-operative Research Project #846, U. S. Office of Education (East Lansing: Bureau of Educational Research Services, Michigan State University, 1962), pp. 15-18.

concerned about how well you do in school?

2. To rank the six subjects in the order of personal preference. The ranking was coded 1 to 6 with the best liked subject receiving a code of 1. This rating was included to permit examination of the relationship between self-concept scores and best and least liked subject.
3. To indicate how far they would like to go in school or college and how far they expected they really would go.

#### ADMINISTERING AND SCORING TESTS

The testing program was carried out by the writer. The testing schedule was arranged in such a way that not more than a morning or afternoon was used for testing in one day with a given group of pupils. The order of presentation of the tests and questionnaires were the same for all pupils involved in the study. Appendix E gives the schedule of the test program.

To convert the scores on the Canadian Lorge-Thorndike Intelligence Tests the so-called deviation I.Q. obtained from a table furnished by the authors was used. These I.Q.'s have a norm of 100 and a standard deviation of 16. The tests were hand scored using a scoring mask.

#### ACHIEVEMENT CATEGORIES

It has been pointed out that deficiencies in the



operational procedures for obtaining over- and under-achieving groups are found in many studies. The failure to control for ability occurs whenever the method for choosing achievement groups focuses on the discrepancy between observed aptitude and observed grades. Lavin states: "The solution to this problem lies in operationally defining over-achievement and under-achievement as discrepancies between observed grades and predicted grades."<sup>4</sup> Figure 3 illustrates this method of designating achievement categories. It permits the investigation of three distinct groups: over-achievers, achievers (those working to the level of their ability) and under-achievers at three ability levels.

Chi square, used as a test of independence between I.Q. and grades, gave no grounds for rejecting the hypothesis of independence of these two variables. Since there are at this time neither predictive validity data nor local norms available for the Canadian Lorge-Thorndike Intelligence Tests, the predicted grade in this study is a value computed from a regression equation between intelligence score and obtained grades on the total grade eight population. The equation of the line is given in Appendix F.

#### DATA PROCESSING

Data from the tests were transferred to intermediate sheets, coded and punched on I.B.M. cards. The statistical

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<sup>4</sup>Lavin, op. cit., p. 28.

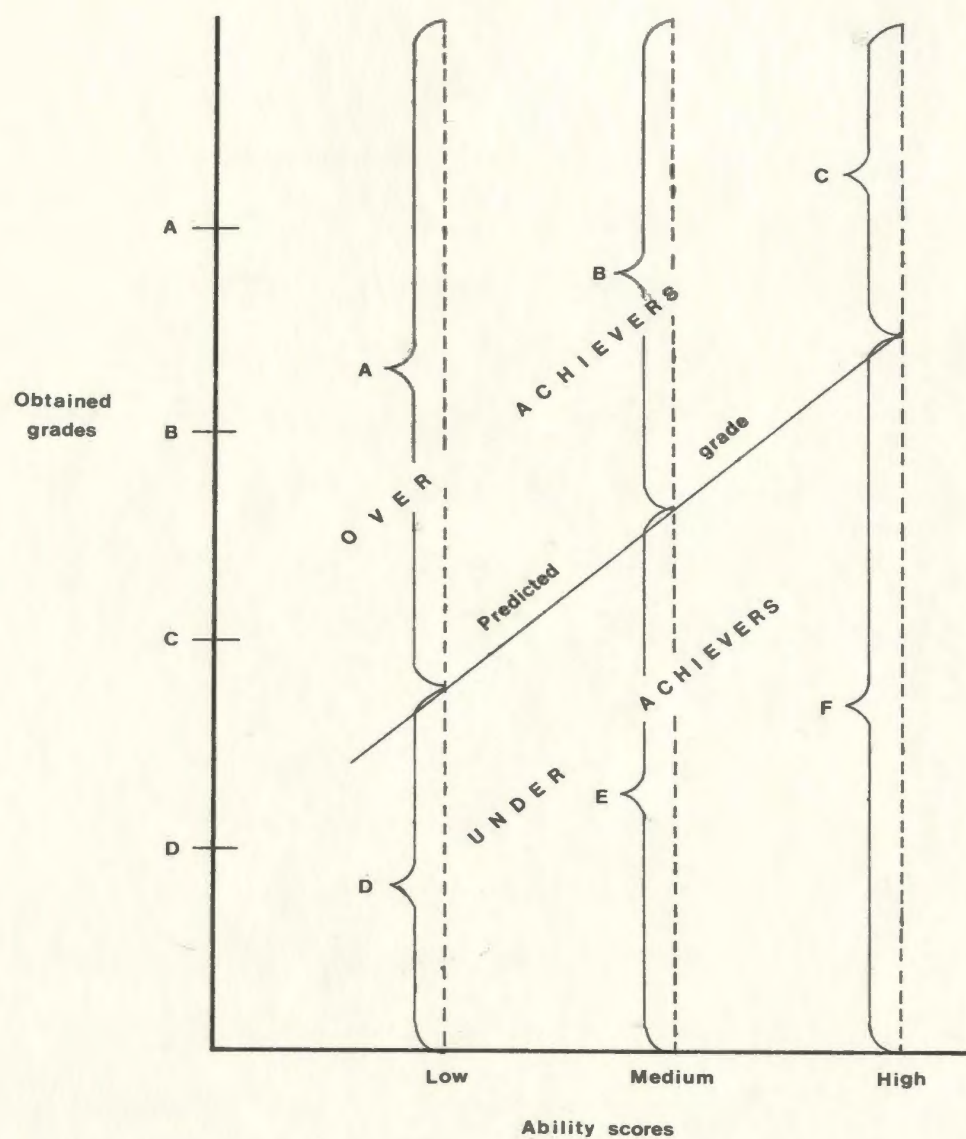


FIGURE 3

ACHIEVEMENT CATEGORIES FROM CORRELATION  
OF ABILITY SCORE WITH OBTAINED GRADE



procedures used to analyze the data and to test the hypotheses included a computer program to obtain Pearson product moment correlation coefficients. Partial Pearson product moment correlation coefficients and t tests were also used in the analysis. A description of the statistical procedures used to test the hypotheses of the study are given below.

1. To test hypothesis 1, a Pearson product moment correlation coefficient was calculated. A t-test for the significance of the partial correlation at .05 level was also used.<sup>5</sup>
2. Hypotheses 2 and 3 were tested by using a t-test for the significance of the difference at the .05 level between two means for independent samples.<sup>6</sup>
3. To test the significance of the difference at the .05 level between the mean self-concept scores of best and least liked subject, a t-test for the significance of the difference between two means for correlated samples was used.<sup>7</sup>

The data from the aspiration-expectation portion of the questionnaire were coded by hand through a simple rating scale and only obvious discrepancies were noted.

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<sup>5</sup>George A. Ferguson, Statistical Analysis in Psychology and Education (New York: McGraw Hill, 1971), p. 391.

<sup>6</sup>Ibid., p. 170.

<sup>7</sup>Ibid., p. 171.

## CHAPTER IV

### ANALYSIS OF DATA

The first section of this chapter gives an overall view of the pupils classified by each of the several variables used in the study. The findings from the questionnaire are given in the second section. The third and final portion of this chapter explores the relationship of the general and specific self-concept of ability scores to achievement. It reports the statistical testing of the basic hypotheses which were stated in Chapter II and presents the findings of the study.

#### DESCRIPTIVE ANALYSIS

The pupils participating in this study are classified in the following order: sex, type of school attended, age, intelligence and father's occupation.

##### Sex

As shown in Table 1, there were 210 grade eight pupils in the schools studied. Of this number, 99 were girls and 111 were boys. Since 17 students were absent from school during one or more of the testing sessions, complete information was obtained for only 193 pupils. Only those students



for whom complete data were obtained will be used in subsequent analyses.

TABLE 1  
PUPILS CLASSIFIED BY SEX

	Number Attending School	Number for Whom Complete Information Obtained
Girls	99	96
Boys	<u>111</u>	<u>97</u>
	210	193

### Intelligence

In Table 2 the Verbal I.Q.'s of pupils have been classified into a frequency distribution both on the basis of sex and as one group. This Table indicates little difference between the mean I.Q.'s for girls and boys.

The I.Q. scores were normally distributed. Chi square was used as a test of goodness of fit. The agreement between the observed and theoretical frequencies was sufficient to support the assumption that the sampled population was of normal form. The mean I.Q. of the total sample was 12.8 points below that of the pupils comprising the norming population. Boys were 14.2 points and girls 11.5 points below this mean. The correlation between Verbal and Non-Verbal Battery scores was .705. Mean age and I.Q. of pupils by sex and school attended are given in Table 3. Total mean age for boys and girls was 172.75 months or 14.4 years.

TABLE 2  
PUPILS CLASSIFIED BY INTELLIGENCE

Class Intervals I.Q.	Boys		Girls		Both	
	No.	Percent	No.	Percent	No.	Percent
130 and over	0	0	0	0	0	0
120-129	1	1.03	2	2.08	3	1.55
110-119	6	6.18	4	4.17	10	5.18
100-109	6	6.18	14	14.58	20	10.36
90-99	15	15.46	22	22.92	37	19.17
80-89	38	39.18	29	30.21	67	34.72
70-79	27	27.84	19	19.18	46	23.83
60-69	4	4.12	5	5.21	9	4.66
50-59	--	--	1	1.04	1	0.52
Mean		85.78		88.5		87.15
S.D.		12.85		13.56		13.25



Table 3 indicates that with one exception the mean I.Q. of the girls in each school was consistently higher than that of the boys. The mean ages of both boys and girls were comparable in all schools.

TABLE 3  
MEAN AGE AND I.Q. OF PUPILS BY  
SEX AND SCHOOL ATTENDED

School	Mean Age (Months)		Mean I.Q.	
	Boys	Girls	Boys	Girls
Ferryland	175.57	176.53	80.86	88.59
Mobile	173.55	170.72	80.85	87.76
Renews	171.77	169.55	94.59	91.64
Trepassey	175.6	173.5	88.35	90.71
Cape Broyle	175.2	174.36	81.0	84.5

### Social Class

A description of the occupation of the father was obtained from school records and then quantified by means of the Blishen Scale. Table 4 presents a classification of pupils on the basis of the seven occupational categories of the scale. The most striking feature of this Table is that over 90 percent of all pupils have fathers whose occupational status falls in the three lowest categories. Less than 3.5 percent of students had fathers in the highly skilled, managerial or professional categories. One other factor worthy of note is the large number of students whose fathers were either deceased or unemployed. The students in this group

represented nearly 18 percent of total students in grade eight.

TABLE 4  
CLASSIFICATION OF PUPILS BY FATHER'S OCCUPATION

Class	Number of Pupils	Percent
1	0	
2	3	1.4
3	4	2.0
4	10	5.1
5	22	11.2
6	57	29.1
7	66	33.7
Deceased or Unemployed	<u>31</u>	<u>17.3</u>
	193	99.9

Table 5 gives the mean and standard deviations for self-concept scores and grades for both boys and girls. The mean self-concept score for girls was 27.14 and for boys 25.3. The mean achievement score for girls is 66.05 and for boys 57.84.

TABLE 5  
MEAN SELF-CONCEPT SCORE BY SEX (MAXIMUM 40)

	No.	Mean Self Concept Score	S.D.	Mean Achieve- ment Score	S.D.
Boys	96	25.3	4.9	57.84	13.0
Girls	97	27.14	4.61	66.05	13.4



## RESULTS OF QUESTIONNAIRE

The following paragraphs give the results of the questionnaire which attempted: 1) to identify the "significant others" related to the student's progress in school, 2) to identify the student's best liked and least liked subjects, and 3) to explore the student's educational aspirations and expectations.

Identification of "Significant Others"

The names of individuals who were "significant others" to the students were obtained in response to the following question: "Who are the people who you feel are concerned about how well you do in school?" The question was left completely open-ended; no specifications were given as to the type of individuals to be listed. Tables 6 and 7 represent the responses to this question. Virtually all students named one or both parents before other persons as concerned with their progress in school. Mothers were named by over 60 percent of the students. Teachers and clergyman were also named frequently by students as concerned with their school work. Teachers were mentioned by 70 percent of the students, both from the total and over- and under-achieving groups, while the clergyman was named by over 50 percent. All the over- and under-achievers mentioned their parents as concerned about their progress in school. Only the female over-achievers gave equal concern to their teachers. Of the male over-achievers, 70 percent of them expressed the view

TABLE 6  
PERCENTAGE OF TOTAL STUDENTS NAMING A  
SPECIFIC "SIGNIFICANT OTHER"

Person Named	Boys	Girls	Total Percent*
Parents	96	94	99
Teachers	65	70	70
Relatives	35	30	35
Pastor	65	46	58
Peers	15	10	13
Non-Classifiable	3	2	2.5

\*Students were permitted to give more than one response;  
thus percent totals more than 100%

TABLE 7  
PERCENTAGE OF OVER- AND UNDER-ACHIEVERS BY  
SEX NAMING SPECIFIC "SIGNIFICANT OTHER"

Person Named	Male High Achievers (N=10)	Male Low Achievers (N=25)	Female High Achievers (N=24)	Female Low Achievers (N=13)	Total Percent*
Parents	10	25	24	13	100
Teachers	7	10	24	8	69.4
Pastor	7	12	15	2	50
Peers	4	2	8	1	20.8
Relatives	3	6	6	2	23.6
Non-Class	0	0	0	0	

\*Students were permitted to give more than one response;  
thus percent totals more than 100%



that their teachers were concerned with how well they do in school, while only 47 percent of male under-achievers expressed this view.

### Identification of Best and Least Liked Subjects

The second portion of the questionnaire asked the students to identify their best as well as their least liked subject. The results are given in Table 8. Approximately equal numbers of boys and girls, about 25 percent of the total group, gave mathematics as both the best liked and least liked subject.

TABLE 8

NUMBER OF STUDENTS BY SEX NAMING A SPECIFIC  
SUBJECT AS BEST AND LEAST LIKED

Subject	Best Liked		Least Liked	
	M	F (N=193)	M	F (N=193)
Science	33	29	4	22
French	6	20	46	21
Mathematics	28	22	21	29
Literature	8	8	10	4
English	8	8	7	4
History	14	9	9	16

The three best liked subjects for boys were science, mathematics and history. For girls, the three best liked subjects were science, French and mathematics. Mathematics was given as the least liked subject for over 30 percent of the girls. Nearly 50 percent of the boys listed French as

their least liked subject. The relationship between best and least liked subjects and self-concept will be discussed in a subsequent section.

### Educational Aspiration and Expectation

The third and final portion of the questionnaire which attempted to explore educational aspirations and expectations was answered by only 80 percent of the students. Of these, another five percent were discarded because of gross inconsistencies between the aspiration and expectation portion. The Appendix D contains a copy of the questionnaire.

Table 9 shows that a higher percentage of females both aspire and expect to attend college than the males. A higher percentage of males both aspire and expect to drop out. The differences in mean self-concept score for these groups will be discussed later in this chapter.

TABLE 9

PERCENTAGE OF STUDENTS BY SEX WHO ASPIRE  
AND EXPECT TO ATTEND COLLEGE OR TO  
COMPLETE HIGH SCHOOL

	Attend College		Complete High School		Drop Out	
	Aspir- ation	Expec- tation	Aspir- ation	Expec- tation	Aspir- ation	Expec- tation
Male N=72	50	30	40	28	10	6
Female N=74	60	40	37	30	3	2



## STATISTICAL ANALYSIS

Because of the exploratory nature of the study, this section will present the relationship between the General Self-Concept of Ability Scale and the Specific Self-Concept of Ability Scale. It will also show the relationship between each of these scales and achievement.

Correlation of Self-Concept Scales with  
Each Other and with Achievement

The correlations between the general self-concept of ability scores and the specific self-concept of ability scores are given in Table 10. They are comparable for males and females except in English and history where the females have a higher correlation and in literature where the males have a higher correlation. While one might expect a high correlation between the two self-concept scales, it may be that both scales are measuring the same variable, or an intervening one.

Table 11 shows the correlation of general self-concept of ability and specific self-concept of ability with general achievement for 97 males and 96 females. It indicates that the general self-concept of ability scale is a better predictor of total grade point average than any of the specific subject scales. The significant differences in the correlations between general self-concept and average achievement score and between specific self-concept and average achievement score may indicate that the two scales do in fact measure somewhat different variables.

TABLE 10

CORRELATION BETWEEN GENERAL SELF-CONCEPT OF ABILITY  
AND SPECIFIC SELF-CONCEPT OF ABILITY IN SIX  
SUBJECTS FOR MALES AND FEMALES

Variables Correlated	Males N=97	Females N=96
Gen. S-C -- S-C Math	.588	.564
Gen. S-C -- S-C Eng.	.590	.664
Gen. S-C -- S-C Hist.	.515	.661
Gen. S-C -- S-C Scien.	.536	.549
Gen. S-C -- S-C Lit.	.617	.521
Gen. S-C -- S-C Fren.	.559	.564

TABLE 11

CORRELATION OF GENERAL SELF-CONCEPT OF ABILITY AND  
SPECIFIC SELF-CONCEPT OF ABILITY WITH ACHIEVE-  
MENT FOR 97 MALES AND 96 FEMALES

Variables Correlated	Males	Females
Gen. S-C -- Av. Achiev. Sc.	.52	.61
Math S-C -- Av. Achiev. Sc.	.48	.55
Eng. S-C -- Av. Achiev. Sc.	.31*	.41*
Hist. S-C -- Av. Achiev. Sc.	.27*	.50
Scien. S-C -- Av. Achiev. Sc.	.36*	.48*
Lit. S-C -- Av. Achiev. Sc.	.37*	.36*
Fren. S-C -- Av. Achiev. Sc.	.50	.57

\*Significantly lower than the correlation between general self-concept and average achievement score at .05 level using t-test for significance of the difference between two correlation coefficients for correlated samples.



Table 12 shows the comparative correlation between specific self-concept of ability and achievement score in the specific subject. It would appear from the data that some nonuniformity exists in the prediction of achievement in specific subjects from the specific self-concept of ability score in that subject. This is especially true for males.

TABLE 12

CORRELATION OF SPECIFIC SELF-CONCEPT OF ABILITY  
WITH ACHIEVEMENT SCORE IN SPECIFIC SUBJECT

Variables Correlated	Males	Females
Math S-C -- Math Achiev. Sc.	.598	.668
Eng. S-C -- Eng. Achiev. Sc.	.335	.469
Hist. S-C -- Hist. Achiev. Sc.	.385	.525
Scien. S-C -- Scien. Achiev. Sc.	.355	.556
Lit. S-C -- Lit. Achiev. Sc.	.477	.525
Fren. S-C -- Fren. Achiev. Sc.	.677	.688

Table 13 compares the correlation between general self-concept and specific subject achievement with the correlation between specific self-concept and specific subject achievement. Only in mathematics, science and French for both boys and girls and in English for girls was there a higher correlation between specific self-concept and specific achievement score than between the general self-concept score and specific achievement score. The data suggest that the general self-concept score is also a good predictor of

TABLE 13

COMPARATIVE CORRELATIONS BETWEEN GENERAL AND SPECIFIC  
SELF-CONCEPT AND SPECIFIC ACHIEVEMENT SCORE

Variables Correlated	Math		Eng.		Hist.		Scien.		Lit.		Fren.	
	M	F	M	F	M	F	M	F	M	F	M	F
Gen. S-C -- Spec. Achievement Score	.42	.59	.42	.53	.47	.56	.34	.43	.56	.58	.40	.47
Spec. S-C -- Spec. Achievement Score	.60	.67	.34	.47	.39	.52	.35	.55	.48	.53	.68	.67
Gen. S-C -- Spec. S-C and Achievement Score	.60	.60	.44	.55	.50	.60	.40	.58	.58	.64	.68	.69



specific grades. The multiple correlations are given in the final line of the Table. In most instances over 36 percent of the variance of specific achievement score is accounted for by variation of general self-concept and specific self-concept score.

Table 14 gives the mean self-concept score and mean achievement score for boys and girls in six subjects. The final line of this Table gives the mean achievement score and mean self-concept score for all subjects. Only in French does the difference in the mean self-concept scores of boys and girls approach significance. The mean self-concept scores in the six subjects are in approximately the same rank order as the average achievement in the subject. This is true for both males and females. The average achievement and self-concept scores for females exceed those of the males in all subjects. The highest mean self-concept score for girls is in English while that for boys is in science.

A comparison of the mean self-concept of ability scores in best liked and least liked subjects is given in Table 15. Analysis of the data indicates that for both boys and girls these differences are significant at the .01 level of probability. Generally, therefore, the students' self-concept of ability is higher in whatever subject he likes best than it is in the subject he likes least. In this instance also, the girls' mean self-concept scores exceed those of the boys. Further research is needed to clarify the relationship between a student's self-concept, his liking or

TABLE 14

MEAN SPECIFIC SELF-CONCEPT OF ABILITY SCORES AND  
AVERAGE ACHIEVEMENT SCORE FOR ALL SUBJECTS  
AND FOR SPECIFIC SUBJECTS

School Subjects	Males		Females	
	Mean S-C	Mean Achievement Score	Mean S-C	Mean Achievement Score
Mathematics	23.04	55.38	24.44	62.7
English	25.19	58.78	27.54	67.28
History	24.95	58.39	26.06	64.96
Science	26.12	61.35	26.38	67.56
Literature	24.05	59.24	26.33	66.79
French	20.16	50.13	26.01	55.17
All Subjects	25.54	57.85	27.15	66.05

TABLE 15

MEAN SELF-CONCEPT SCORES BY BEST AND LEAST  
LIKED SUBJECT FOR BOYS AND GIRLS

	Mean Self-Concept Scores		Level of Significance
	Best Liked Subject	Least Liked Subject	
Girls	28.8	22.9	.01*
Boys	27.23	19.66	.01*

\* t-test for significance of the difference between two means for dependent sample.



disliking a specific subject and his achievement.

Table 16 gives the mean self-concept of ability scores by sex and educational expectation. The mean self-concept of ability scores of students who expect to attend college are significantly higher than the mean self-concept scores of those who expect to complete high school. Even though these data are not representative of the total group, they do indicate that self-concept of ability is related to educational expectations.

TABLE 16  
MEAN SELF-CONCEPT OF ABILITY SCORES BY  
SEX AND EDUCATIONAL EXPECTATION

Mean Self-Concept of Ability Scores				
	Students Who Expect to Attend College	Prob. of Diff.	Students Who Expect to Com- plete School	Students Who Expect to Drop Out
Boys	29.8	.05*	22.4	18
Girls	30	.05*	24	20

\*t-test for significance of the difference between two means for independent samples

### Tests of the Basic Hypotheses

The first hypothesis that self-concept of ability is significantly related to achievement when measured intelligence is controlled, was tested by correlational analysis of the total population on which data were obtained. Table 17 shows the correlations obtained with and without the effect of I.Q. controlled. Of particular interest is the significant

correlation between average achievement score and self-concept when I.Q. is controlled. The lower correlation between self-concept and I.Q. when achievement is controlled indicates that the self-concept scale actually measures quite a different variable than the I.Q. test measures. Of greater interest is the correlation between average achievement score and self-concept when I.Q. is controlled for the over- and under-achievers. The results shown in Table 18 indicate a significant correlation of .477 between these variables and a much lower one, .230, between average achievement score and I.Q.

The second hypothesis stated that there is no significant difference in the mean self-concept of ability scores of over- and under-achievers with similar intelligence levels. The mean self-concept of ability scores of students in a similar I.Q. category but with different achievement levels were compared as a test of the second hypothesis. The findings are given in Table 19. The results of the t test indicate that at high, medium and low levels of intelligence there is a significant difference in the mean self-concept of ability scores of over- and under-achievers. At the low levels of intelligence the difference in the mean self-concept of ability scores was significant at the .02 level of probability. It should be pointed out that each of the higher intelligence groupings had higher mean self-concept scores than the next lower group for both boys and girls.

The third hypothesis stated that there is no signi-



TABLE 17

CORRELATION BETWEEN AVERAGE ACHIEVEMENT SCORE,  
VERBAL I.Q. AND GENERAL SELF-CONCEPT  
OF ABILITY FOR 193 STUDENTS

	No Variables Controlled	One Variable Controlled	Variable Controlled
Av. Achievement Score -- I.Q.	.651	.497	S-C
Av. Achievement Score -- S-C	.577	.358	I.Q.
S-C -- I.Q.	.534	.255	Av. Achieve- ment Score

TABLE 18

CORRELATION BETWEEN AVERAGE ACHIEVEMENT SCORE, VERBAL  
I.Q. AND GENERAL SELF-CONCEPT OF ABILITY FOR  
72 OVER- AND UNDER-ACHIEVERS

	No Variables Controlled	One Variable Controlled	Variable Controlled
Av. Achievement Score -- I.Q.	.435	.230	S-C
Av. Achievement Score -- S-C	.582	.477	I.Q.
S-C -- I.Q.	.463	.287	Av. Achieve- ment Score

TABLE 19  
MEAN SELF-CONCEPT OF ABILITY SCORE  
BY ACHIEVEMENT GROUP

Measured I.Q.	Mean S-C Scores . . .		Level of Significance
	Over- Achievers	Under- Achievers	
High I.Q. > 100.4	32	24.6	.05*
Medium I.Q. $\geq$ 73.9 $\leq$ 100.4	27.7	22.7	.05*
Low I.Q. < 73.9	25.1	18.7	.02*

$\bar{X} = 87.15$

SD = 13.25

\*t-test for significance of the difference between two means for independent samples

ficant difference in the mean self-concept of ability scores of boys and girls with similar levels of intelligence. Table 20 shows the mean self-concept of ability scores for those students who are working to ability. It indicates that only at the low levels of intelligence is there a significant difference in the mean self-concept scores of boys and girls. The limited number of individuals at the high and low intelligence levels obviated any meaningful comparison of self-concept scores of males and females in the over- and under-achieving groups. The mean self-concept score on the total male population (N=96) is 25.3, the standard deviation is 4.9. For girls, the mean self-concept score is 27.1 and the standard deviation 4.61. The difference in mean self-concept



scores of boys and girls at the high and medium levels of intelligence was not significant at the .05 level.

TABLE 20  
MEAN SELF-CONCEPT OF ABILITY SCORES  
FOR ACHIEVERS BY SEX

I.Q.	Mean S-C Scores		Level of Significance
	Male	Female	
High	31.4 (N=9)	30.4 (N=12)	NS
Medium	25.5 (N=45)	28.4 (N=44)	NS
Low	21.8 (N=8)	28 (N=3)	.05*

\*t-test for significance of the difference between two means for independent samples.

#### SUMMARY

The descriptive analysis presented in this chapter showed the distribution of pupils when classified by sex, intelligence, social class, age and school attended as well as their self-concept scores and average achievement score. It was found that of the 193 grade eight students investigated, 97 were boys and 96 were girls. The mean I.Q. of these students was found to be 87.15 and the standard deviation 13.25. The mean I.Q. of the girls was, with one exception, consistently higher than the boys in the schools studied. The mean achievement score for boys was 57.84 and for girls 66.05. The mean self-concept score for boys was 25.3 and for girls 27.14, the highest score possible being 40. According to the Blishen scale of social class, less

than 4 percent of the students had parents in the highly skilled managerial or professional categories. Nearly 18 percent of the students' fathers were deceased or unemployed.

Over 50 percent of the boys and 60 percent of the girls aspired to go to college, but only 30 percent of the boys and 40 percent of the girls really expect that they will actually go. Of the approximately 40 percent who aspire to finish high school, only about 30 percent of them feel they will actually complete the course. Of the boys answering the aspiration-expectation part of the questionnaire, 10 percent said they would like to drop out right now, but only 3 percent of the girls gave this response.

Parents were named by nearly all students as being concerned about how well they do in school. Teachers and clergyman were named by over 50 percent of the students in response to this question. Peers were mentioned by only 13 percent.

\* The three best liked subjects for boys were science, mathematics and history. French was their least liked subject. Science, French and mathematics were the girls' best liked subjects. Mathematics was also given as the least liked subject by 30 percent of the girls.

The correlations between general self-concept scores and specific self-concept scores ranged from a low of .515 to a high of .616. The general self-concept of ability score was more highly correlated with average achievement and specific achievement than the specific self-concept score.



In mathematics and French for both boys and girls there is a higher correlation between specific self-concept and specific achievement than between the general self-concept score and specific achievement. Self-concept of ability is positively related to achievement of eighth grade students. The correlation with measured intelligence controlled is .36. The correlation between self-concept of ability and measured intelligence is .53. When average achievement score is controlled the correlation drops to .25. This indicates that self-concept differs from measured intelligence. Over-achievers had significantly higher mean self-concept of ability scores at the high, medium and low ranges of intelligence than under-achievers in the same intelligence level. Statistical significance of these differences were found at the medium and low levels of intelligence. These differences approached significance even in the high intelligence category. No significant differences were found between the mean self-concept of ability scores of boys and girls who were working to ability at the high and medium intelligence levels. Significant differences occurred at the low levels of intelligence.

The mean specific self-concept of ability score was significantly higher for the subject the student liked best than for the subject liked least. This was true for both boys and girls. The mean self-concept score of students who expected to go to college was significantly higher than the mean self-concept score of students who expected to complete high school.

## CHAPTER V

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This final chapter summarizes the purpose, methodology and findings of the study. It presents some tentative conclusions and suggests several areas where further research is needed.

#### SUMMARY

The major purpose of this study was to investigate the relationship between self-concept of ability and achievement in grade eight students in a rural area of Newfoundland. An attempt was made to identify the "significant others" related to achievement, to explore the relationship between best and least liked subject and self-concept and finally to determine the relationship between educational expectation and self-concept of ability. Hypothesis 1 predicted that there would be no significant relationship between pupils' self-concept of ability scores and their achievement scores. Likewise it was predicted in Hypothesis 2 that there would be no significant difference in the mean self-concept scores of over- and under-achievers with similar intelligence levels. Hypothesis 3 predicted no significant difference in the mean self-concept scores of boys and girls with similar intelligence levels.

The sample consisted of 193 grade eight students of



whom 96 were girls and 97 were boys. Achievement categories were determined by means of a regression equation of grades on I.Q. for the total group. Students who were one standard error of prediction above the line were designated over-achievers. Those students whose grades fell one standard error of prediction below the line were designated under-achievers. All others were placed in the achiever category.

The testing program was carried out from May 14 to May 30, 1971. The instrumentations consisted of a standardized intelligence test, two self-concept scales and a questionnaire. The Canadian Lorge Thorndike Intelligence Tests, Verbal Edition, was used to measure intelligence. The self-concept scales measured general and specific subject self-concept of ability of the students. The questionnaire attempted to identify 1) "significant others" related to progress in school, 2) best and least liked subject, and 3) educational aspirations and expectations of students.

The data relevant to the study were taken from the questionnaires and answer sheets coded and punched on IBM cards. Mean scores for girls, for boys and for both groups were calculated where feasible on the variables used in the study. The t-test was used to test the significance of the difference between means. Pearson product moment correlation and partial Pearson product moment correlation were also used.

#### CONCLUSIONS AND IMPLICATIONS

While no definitive statements can be made on the

basis of the finding of this exploratory study, some tentative conclusions might be drawn and implications made.

General self-concept of ability was found to be significantly related to achievement when measured intelligence is controlled. Of greater importance was the significant difference in the mean self-concept scores of over- and under-achievers with the same intelligence levels.

x The implications from these findings is that a student's performance depends not only on how intelligent the student actually is, but also on how intelligent he thinks he is. A crucial question for all self-concept research related to school achievement is which comes first, a positive self-concept or high achievement. It does seem reasonable, as Hamachek suggests, "that each is mutually reinforcing to the other to the extent that a positive change in one facilitates a positive change in the other."<sup>1</sup>

Two prime requirements theoretically for learning are motivation and the visibility, real or apparent, of a reward. To these may be added a positive self-concept of ability. Since these three factors may be interrelated, every effort should be made by teachers and counsellors to assist those children who begin school with experiential handicaps. The school program itself may often generate negative self-concepts of ability which some experts suggest are conceptualized as early as the

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<sup>1</sup>Don E. Hamachek, Encounters with the Self (New York: Holt, Rinehart and Winston, Inc., 1971), p. 187.



second or third year of school.<sup>2</sup> Both the family and the school play an important role in the formation of the child's belief about self. Only recently has the school acknowledged the variation in life styles between the low and high income groups and the influence of family on the academic self-concept of the child. The school is a major contributing agent in the formation of a positive or negative self-concept of ability. There is a need to look at current educational practices in terms of whether they enhance or destroy the self status of students. In this study girls have a consistently higher mean self-concept of ability score than boys at all intelligence levels. Girls also have higher achievement scores. These findings suggest that girls have more positive feelings about their ability to do school work than boys. Meyer and Thompson, for instance, have reported that girls are more likely to get higher grades than boys of equal ability and achievement. Boys also receive more disapproval and become increasingly negative in their attitude to school as they progress through grades seven to eleven.<sup>3</sup> Some differential biases may exist towards males in the school situation.

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<sup>2</sup>W. W. Wattenberg and C. Clifford, "Relations of Self-Concepts to beginning Achievement in Reading," Child Development, XXXV (June, 1964), 461-467.

<sup>3</sup>W. J. Meyer and G. G. Thompson, "Sex Differences in the Distribution of Teacher Approval and Disapproval Among Sixth Grade Children," Journal of Educational Psychology, XLIII (May, 1956), 218-228.

In this study it was found that over 70 percent of students viewed teachers as interested in their progress in school. The teacher who comes into daily contact with students must necessarily influence them. How teachers view a student and react to him becomes a factor on how he views himself. The teacher who believes in the fixed character of pupils' abilities and traits can contribute to a negative self-concept perhaps with tragic consequences if the child perceives himself as a failure early in his school career.

\* The development of self-concept is particularly affected by the role of "significant others" in the life of the child. Certainly the classroom teacher and counsellors should be included in this group. Poverty, parental neglect, and related social conditions impose many stresses which may lead to the development of a negative self-concept of ability in the child. The education of teachers should emphasize the developmental approach to learning with a preventive rather than remedial approach to academic deficits. A major goal of the school counsellor should be to effect change in expectations, attitudes and values of teachers as well as to encourage the development of a positive self-concept of ability in students.

† The impact of failure and non-promotion should be viewed in relation to its influence on the student's self-concept. There is evidence to suggest that non-promotion contributes neither to educational objectives nor to student welfare. One could suggest that it leads to the development



of a poor self-concept of ability which may lead to withdrawal from school.

\* The finding that self-concept of ability is significantly related to liking a subject is worthy of consideration. Ideally, interest in the material to be learned is the best stimulus to learning. More information is needed as to how likes and dislikes of particular subjects develop, especially in the lower grades. If liking a subject is reflected in a high self-concept of ability which in turn produces better achievement, great effort should be made by teachers to lessen these dislikes as much as possible in the early formative years of the student. It may be suggested that achievement is reflected in a high self-concept of ability which in turn enhances liking a subject.

\* A strong positive relationship was also apparent between self-concept of ability and level of educational expectation. This finding suggests that even at the eighth grade level many students see themselves as educationally stereotyped. The implication for students with low self-concept of ability is indirectly a low level of educational and occupational aspiration.

With regard to career planning, educators and especially counsellors should recognize human worth and dignity in all kinds of employment with less emphasis placed on status jobs and intellectual pursuits. There are many subtle pressures in the school which imply to the young child that the only worthy people are those who plan to enter college.

Each young person should be afforded the opportunity to contribute to his society in a manner which he can best give.

The non-graded school as a replacement for the graded system has certain advantages for development of a positive self-concept. Luchins and Luchins examined the attitudes of children toward grouping and found that not only were children aware of the difference when several ability groups are created within a grade, but those in lower groups strongly desire to be in the highest group.<sup>4</sup> In the light of other studies, ability grouping is a questionable practice even in terms of academic achievement and appears highly unfavourable to the development of a positive self-concept.<sup>5</sup> Compulsory education affords little escape for the child who finds himself in an intolerable school situation. The school should provide continuous educational experience, adjusted to individual rates of development and interest, in keeping with the development of a positive concept of self. While the non-graded school is not the complete answer, it does allow for variation in individual rates of progress with less injury to the child's concept of self.

#### RECOMMENDATIONS FOR RESEARCH

Several suggestions can be made concerning further

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<sup>4</sup>H. I. Luchins and E. H. Luchins, "Children's Attitudes Toward Homogenous Groupings," Journal of Genetic Psychology, LXXII (March, 1948), 3-9.

<sup>5</sup>M. Goldberg, A. W. Passow and J. Justman, The Effects of Ability Grouping (New York: Teachers College, Columbia University, 1966).



research with regard to self-concept of ability and achievement.

1. Similar research is needed in rural areas to verify the findings of this study using larger numbers of students. It will then be possible to investigate differences between groups (male and female) in the over- and under-achieving categories.
2. Studies should also be undertaken in an area where a more heterogenous socioeconomic level exists.
3. Research is also necessary to ascertain how parental attitudes towards school and the child's ability are related to the child's self-concept and his achievement.
4. Several other questions need further study:
  - (1) Is a change in self-concept of ability accompanied by a concomitant change in school achievement?
  - (2) What is the relationship between liking a subject and achievement in that subject?
  - (3) How and why do likes and dislikes for subject matter develop?
  - (4) What teaching practices are most conducive to positive self-concept development?

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APPENDIX A  
GENERAL SELF-CONCEPT OF ABILITY



## GENERAL SELF-CONCEPT OF ABILITY

1. Where do you think you would rank in your class in high school?
  - a. among the best
  - b. above average
  - c. average
  - d. below average
  - e. among the poorest
2. In order to become a doctor, lawyer, or university professor, work beyond four years of college is necessary. How likely do you think it is that you could complete such advanced work?
  - a. very likely
  - b. somewhat likely
  - c. not sure either way
  - d. unlikely
  - e. most unlikely
3. Do you think you have the ability to complete college?
  - a. yes, definitely
  - b. yes, probably
  - c. not sure either way
  - d. probably not
  - e. no
4. How do you rate yourself in school ability compared with those in your class at school?
  - a. I am among the best
  - b. I am above average
  - c. I am average
  - d. I am below average
  - e. I am among the poorest
5. Forget for a moment how others grade your work. In your own opinion how good do you think your work is?
  - a. my work is excellent
  - b. my work is good
  - c. my work is average
  - d. my work is below average
  - e. my work is much below average

6. What kind of grades do you think you are capable of getting?
- a. mostly A's
  - b. mostly B's
  - c. mostly C's
  - d. mostly D's
  - e. mostly E's
7. Where do you think you would rank in your class in college?
- a. among the best
  - b. above average
  - c. average
  - d. below average
  - e. among the poorest
8. How do you rate yourself in school ability compared with your close friends?
- a. I am the best
  - b. I am above average
  - c. I am average
  - d. I am below average
  - e. I am the poorest



APPENDIX B

SPECIFIC SELF-CONCEPT OF ABILITY

## SPECIFIC SELF-CONCEPT OF ABILITY

Now we would like you to again answer some of the same questions, but this time about six different subjects which you are now taking or have taken in the past.

Circle the "X" under the heading which best answers the question. Answer for all six subjects. (You will have one "X" circled on each line.)

1. How do you rate your ability in the following school subjects compared with your close friends?

	I am the poorest	I am below average	I am average	I am above average	I am the best
Math	X	X	X	X	X
English	X	X	X	X	X
History & Geography	X	X	X	X	X
Science	X	X	X	X	X
Literature	X	X	X	X	X
French	X	X	X	X	X

2. How do you rate your ability in the following school subjects compared with those in your class at school?

	I am among the poorest	I am below average	I am average	I am above average	I am the best
Math	X	X	X	X	X
English	X	X	X	X	X
History & Geography	X	X	X	X	X
Science	X	X	X	X	X
Literature	X	X	X	X	X
French	X	X	X	X	X



3. Where do you think you would rank in your high school graduating class in the following subjects?

	among the poorest	below average	average	above average	among the best
Math	X	X	X	X	X
English	X	X	X	X	X
History & Geography	X	X	X	X	X
Science	X	X	X	X	X
Literature	X	X	X	X	X
French	X	X	X	X	X

4. Do you think you have the ability to do college work in the following subjects?

	no	probably not	not sure either way	yes, probably	yes, definitely
Math	X	X	X	X	X
English	X	X	X	X	X
History & Geography	X	X	X	X	X
Science	X	X	X	X	X
Literature	X	X	X	X	X
French	X	X	X	X	X

5. Where do you think you would rank in your college class in the following subjects?

	among the poorest	below average	average	above average	among the best
Math	X	X	X	X	X
English	X	X	X	X	X
History & Geography	X	X	X	X	X
Science	X	X	X	X	X
Literature	X	X	X	X	X
French	X	X	X	X	X

6. How likely do you think it is that you could complete advanced work beyond college in the following subjects?

	most unlikely	unlikely	not sure either way	somewhat unlikely	very likely
Math	X	X	X	X	X
English	X	X	X	X	X
History & Geography	X	X	X	X	X
Science	X	X	X	X	X
Literature	X	X	X	X	X
French	X	X	X	X	X



APPENDIX C  
QUESTIONNAIRE

## QUESTIONNAIRE

1. Who are the people you feel are concerned about how well you do in school?
2. We would like to know well you like six school subjects -- Math, English, History & Geography, Science, Literature, and French. Please indicate how well you like these subjects by putting "1" after the subject you like best; "2" after the subject you like second best; "3" after the subject you like third best; "4" after the subject you like fourth best; "5" after the subject you like fifth best; and "6" after the subject you like the least.

Math	_____
English	_____
History & Geography	_____
Science	_____
Literature	_____
French	_____

Please circle the letter in front of the statement which best answers each question.

3. If you were free to go as far as you wanted in school, how far would you like to go?
  - a. I'd like to quit right now.
  - b. I'd like to go to high school for a while.
  - c. I'd like to graduate from high school.
  - d. I'd like to go to business school or some other technical school.
  - e. I'd like to go to college for a while.
  - f. I'd like to graduate from college.
  - g. I'd like to do graduate work beyond college.
4. Sometimes what we would like to do isn't the same as what we expect to do. How far in school do you expect you really will go?
  - a. I think I really will quit school as soon as I can.
  - b. I think I really will go to high school for a while.
  - c. I think I really will graduate from high school.
  - d. I think I really will go to business school or technical school.
  - e. I think I really will go to college for a while.
  - f. I think I really will graduate from college.
  - g. I think I really will do graduate work beyond college.



APPENDIX D  
BLISHEN SCALE

# BLISHEN OCCUPATIONAL CLASS SCALE

Table 1 -- Occupations Ranked and Grouped According to Combined Standard Scores for Income and Years of Schooling, by Sex, Canada, 1951<sup>a</sup>

Occupation	Sex	Score <sup>b</sup>
Class 1		
Judges	M	90.0
Dentists	M	82.5
Physicians and Surgeons	M	81.2
Lawyers	M	78.8
Engineers, chemical	M	77.8
Actuaries	M	77.6
Engineers, mining	M	77.4
Engineers, electrical	M	75.2
Engineers, civil	M	75.0
Architects	M	73.2
Class 2		
Statisticians	F	72.9
Engineers, mechanical	M	72.6
Professors	M	72.0
Stock and bond brokers	M	70.9
Veterinarians	M	69.8
Business Service Officers	M	69.5
Statisticians	M	68.8
Mining Managers	M	67.9
Finance Managers	M	67.7
Osteopaths and chiropractors	M	67.3
Dietitians	F	67.0
Professors	F	66.7
Chemists and metallurgists	M	65.8
Officers, armed forces	M	65.1
Air pilots	M	65.0
Chemists and metallurgists	F	64.8
Agricultural professionals	M	64.8
Electricity, gas and water officials	M	64.7
Other professions, hockey players	M	64.0
Construction managers	M	63.8
Wholesale trade managers	M	63.5
Librarians	F	63.4
Authors, editors and journalists	M	63.4
Manufacturing managers	M	63.0



Occupation	Sex	Score <sup>b</sup>
Community service workers	M	62.4
Social Welfare workers	F	62.2
Osteopaths and chiropractors	F	62.2
School teachers	M	62.2
Librarians	M	62.0
Accountants and auditors	M	61.8
Authors, editors and journalists	F	61.4
Clergymen	M	61.0
Designers, clothing	M	60.6
Government service officials	M	60.6
Transportation managers	M	60.1
Farmers	F	59.4
Community service workers	F	59.1
Dispatchers, train	M	58.5
Designers, cloth	F	58.2
Insurance agents	M	58.2
Foremen, communication	M	58.1
Advertising agents	M	58.0
Managers N.E.S. <sup>c</sup>	M	57.7
School teachers	F	57.6
Artists and teachers of art	M	57.6
Nurses, graduate	F	57.4
Real estate agents and dealers	M	57.0
Social welfare workers	M	57.0
Retail trade managers	M	57.0

## Class 3

Actors, models	F	56.9
Commercial travellers	M	56.7
Advertising agents	F	56.6
Forestry managers	M	56.5
Artists, commercial	F	56.4
Radio announcers	M	56.4
Laboratory technicians N.E.S. <sup>c</sup>	F	56.0
Artists, commercial	M	56.0
Draughtsmen	M	56.0
Brokers, agents and appraisers	M	56.0
Inspectors, communication	M	55.0
Artists and teachers of art	F	55.0
Surveyors	M	55.0
Recreation service officers	M	54.8
Purchasing agents	M	54.8
Agents, ticket station	M	54.3
Laboratory technicians N.E.S. <sup>c</sup>	M	54.2
Stenographers and typists	F	54.1
Conductors, railway	M	54.1
Radio operators	M	54.0
Locomotive engineers	M	54.0
Photo-engravers	M	54.0
Music teachers	M	53.7
Teachers N.E.S. <sup>c</sup>	F	53.6
Office appliance operators	F	53.4

Occupation	Sex	Score <sup>b</sup>
Teachers N.E.S. <sup>c</sup>	M	53.4
Retail trade managers	F	53.3
Telegraph operators	F	52.9
Foremen, mining	M	52.8
Window-decorators	F	52.3
Nurses, graduate	M	52.2
Actors	M	52.1
Stenographers	M	52.0

## Class 4

Bookkeepers and cashiers	F	51.9
Forewomen, communication	F	51.8
Foremen, manufacturing	M	51.8
Photographers	M	51.8
Inspectors, construction	M	51.7
Window-decorators	M	51.6
Telegraph operators	M	51.6
Petroleum refiners	M	51.6
Toolmakers	M	51.6
Engravers, except photo-engravers	M	51.4
Undertakers	M	51.3
Office Clerks	F	51.2
Locomotive firemen	M	51.2
Bookkeepers and cashiers	M	51.2
Brakemen, railway	M	51.1
Power station operators	M	51.0
Office appliance operators	M	51.0
Doctor, dentist attendants	F	50.8
Motion picture projectionists	M	50.8
Radio repairmen	M	50.8
Captains, mates, pilots	M	50.7
Foremen, transportation	M	50.7
Foremen, commercial	M	50.6
Personal service officers	M	50.5

## Class 5

Patternmakers	M	50.4
Compositors	M	50.4
Inspectors, metal	M	50.4
Paper-makers	M	50.4
Photographers	F	50.2
Policemen	M	50.2
Office clerks	M	50.2
Mechanics, airplane	M	50.1
Inspectors, metal products	F	50.0
Music teachers	F	50.0
Firemen, fire department	M	49.8
Pressmen and plate printers	M	49.8
Telephone operators	F	49.6



Occupation	Sex	Score <sup>b</sup>
Electricians	M	49.6
Machinists, metal	M	49.6
Linemen and servicemen	M	49.4
Engineering officers (on ships)	M	49.4
Baggagemen	M	49.4
Transportation Inspectors	M	49.4
Rolling millmen	M	49.4
Auctioneers	M	49.3
Inspectors and graders	M	49.2
Farmers	M	49.2
Photographic occupations N.E.S. <sup>c</sup>	M	49.2
Collectors	M	49.1
Dental mechanics	M	49.1
Sulphite cookers	M	49.0
Wire drawers	M	46.9
Other ranks, armed forces	M,F	46.8
Electroplaters	M	46.8
Plumbers	M	46.8
Motormen	M	46.7
Quarriers	M	46.6
Machine operators, metal	M	46.5
Paint makers	M	46.4
Filers	M	46.4
Upholsterers	M	46.3
Knitters	M	46.3
Wood Inspectors	M	46.3
Opticians	F	47.6
Bus drivers, taxi	M	47.6
Heat treaters	M	47.6
Religious workers N.E.S. <sup>c</sup>	F	47.6
Photographic workers N.E.S. <sup>c</sup>	F	47.4
Machine operators, metal	F	47.4
Boilermakers	M	47.3
Jewellers and watchmakers	F	47.2
Other bookbinding workers N.E.S. <sup>c</sup>	M	47.2
Sales Clerks	M	47.2
Hoistmen, crane men	M	47.2
Welders, general trade	M	47.2
Mechanics N.E.S. <sup>c</sup>	M	47.2
Mechanics, railroad	M	47.2
Fitters, metal	M	47.2
Cutters, textile goods	M	47.2
Millmen	M	47.2
Wire drawers	F	47.1
Core makers	F	47.1
Riggers	M	47.1
Sheetmetal workers	M	47.1
Shipping clerks	M	47.0
Logging foremen	M	45.4
Labellers	M	45.3
Nurses, in training	F	45.2

Occupation	Sex	Score <sup>b</sup>
Meat canners	M	45.2
Farm managers	M	45.2
Plasterers	M	45.2
Textile inspectors	M	45.1
Other pulp and paper workers	F	45.1
Class 6		
Winders and warpers	F	45.0
Carders and drawing frame workers	F	45.0
Sales clerks	F	45.0
Moulders, metal	M	45.0
Nurses, practical	M	45.0
Cutters, textile goods	F	44.9
Elevator tenders	F	44.8
Tailoresses	F	44.8
Textile inspectors	F	44.8
Potmen	M	44.8
Timbermen	M	44.7
Prospectors	M	44.7
Barbers	F	46.2
Milliners	F	46.2
Tobacco products workers	F	46.2
Furnacemen	M	46.2
Furriers	M	46.2
Brothers (religion)	M	46.1
Paper box makers	M	46.1
Other bookbinding workers N.E.S. <sup>c</sup>	F	46.0
Coremakers	M	46.0
Vulcanizers	M	46.0
Liquor and beverage workers	M	46.0
Postmen	M	45.9
Meat canners	F	45.9
Other upholstering workers N.E.S. <sup>c</sup>	F	45.8
Bookbinders	F	45.8
Transportation, storage, communication workers	F	45.8
Polishers, metal	M	45.8
Furriers	F	45.6
Structural Iron workers	M	45.6
Mechanics, motor	M	45.6
Textile inspectors	M	45.6
Cabinet and furniture makers	M	45.5
Loom fixers	M	45.5
Weavers, textile	F	45.4
Butchers	M	45.4
Miners	M	45.4
Assemblers, electrical equipment	F	48.9
Operators, electric street railway	M	48.8
Stationary engineers	M	48.7
Bookbinders	M	48.6



Occupation	Sex	Score <sup>b</sup>
Tire and tube builders	M	48.4
Canvassers	F	48.2
Telephone operators	M	48.2
Switchmen and signalmen	M	48.2
Opticians	M	48.2
Jewellers and watchmakers	M	48.2
Personal service workers	F	48.1
Assemblers, electrical equipment	M	48.1
Tire and tube builders	M	48.1
Millwrights (repairs machinery in mills)	M	48.0
Religious workers N.E.S. <sup>c</sup>	M	48.0
Fitters, metal	F	47.9
Milliners	M	47.8
Construction foremen	M	47.7
Oilers, power plant	M	47.7
Liquor and beverage workers	F	44.6
Paper box makers	F	44.6
Kiln burners	M	44.6
Brick and stone masons	M	44.6
Construction machine operators	M	44.5
Canvassers	F	44.4
Service station attendants	M	44.4
Painters and decorators	M	44.4
Hat and cap makers	M	44.4
Bleachers and dyers	M	44.4
Spinners and twisters	F	44.3
Rubber shoe makers	F	44.2
Porters	M	44.2
Tobacco products workers	M	44.2
Millers	M	44.2
Nurses, practical	F	44.1
Finishers, textile	F	44.0
Blacksmiths	M	44.0
Tailors	M	43.8
Bakers	M	43.8
Weavers	M	43.8
Rubber shoe makers	M	43.7
Labellers	F	43.6
Other personal service workers	F	43.6
Barbers	M	43.6
Truck drivers	M	43.6
Packers and wrappers	M	43.6
Finishers, textile	M	43.6
Tanners	M	43.6
Finishers, wood	M	43.5
Hat and cap makers	F	43.5
Cutters, leather	F	43.5
Commercial packers and wrappers	F	43.4
Teamsters	M	43.4
Stone cutters	M	43.4
Riveters and rivet heaters	M	43.4

Occupation	Sex	Score <sup>b</sup>
Butter and cheese makers	M	43.3
Chauffeurs	M	43.3
Boiler firemen	M	43.3
Spinners	M	43.3
Inspectors N.E.S., graders <sup>c</sup>	F	43.2
Postmen	F	43.2
Waiters	M	43.2
Carpenters	M	43.2
Sewers and sewing machine operators	M	43.2
Forest rangers	M	43.2
Lock keepers, canalmen	M	43.1
Wood turners	M	43.1
Labourers, mines and quarries	M	43.1
Sewers and sewing machine operators	F	43.0
Brick and stone masons <sup>1</sup>	M	43.0
Textile inspectors	F	42.8
Machine operators, boot and shoe	F	42.8
Knitters	F	42.8
Guards, commissionaries	M	42.8
Winders, warpers, reelers	M	42.8
Glove makers	M	42.7
Cutters, leather	F	42.6
Elevator tenders	M	42.5
Bakers	F	42.4
Machine operators, boot and shoe	M	42.4
Launderers	M	42.4
Firemen, on ships	M	42.4
Cement and concrete finishers	M	42.4
Dressmakers and seamstresses	F	42.3
Carders and drawing frame tenders	M	42.3
Box and basket makers	F	42.2
Coopers	M	42.2
Sailors	M	42.1
Harness and saddle makers	M	42.0
Nuns	F	41.8

## Class 7

Cooks	M	41.8
Janitors	M	41.6
Laundresses, cleaners and dyers	F	41.4
Sectionmen and trackmen	M	41.4
Charworkers and cleaners	M	41.3
Paper box, bag and envelope makers	M	41.3
Sawyers	M	41.2
Longshoremen	M	41.2
Waitresses	F	41.2
Glove makers	F	41.2
Labourers	M	40.8
Cooks	F	40.5
Messengers	M	40.2



Occupation	Sex	Score <sup>b</sup>
Shoemakers	M	40.2
Ushers	M	40.1
Janitors	F	40.0
Hawkers	M	39.3
Housekeepers and matrons	F	38.9
Hotel cafe and household workers	M	38.8
Newsboys	M	38.7
Guides	M	38.8
Hotel cafe and household workers	F	37.8
Farm labourers	M	37.5
Lumbermen	M	37.4
Charworkers and cleaners	F	37.4
Fishermen	M	36.9
Bootblacks	M	36.8
Fish canners, curers and packers	M	36.2
Hunters and trappers	M	32.0
Fish canners, curers and packers	F	36.0

<sup>a</sup>Canada, Dominion of Statistics, Census of Canada, V, Table 21 and IV, Table 11 (Ottawa, 1953), Canada, Dept. of Internal Revenue, Taxation Statistics, 1951 (Ottawa, 1953). Additional information supplied by D.B.S. Census Analysis Section.

<sup>b</sup>The mean of the scores = 50, the standard deviation = 10 (calculated separately for each sex).

<sup>c</sup>N.E.S. = not elsewhere specified.

APPENDIX E  
TESTING SCHEDULE



# APPENDIX E

## TESTING SCHEDULE

Time	Test	Administration Time
Morning:		
9:30 A.M. to 10:30	Self-Concept of Ability Scale -- General & Specific	40 min.
11:00-12:00	Questionnaire	30 min.
Afternoon:		
2:00 P.M.	Lorge-Thorndike Intelligence Tests Verbal Edition	35 min.
Morning:	Lorge-Thorndike Intelligence Tests Non-Verbal Edition	27 min.

APPENDIX F

REGRESSION EQUATION OF AVERAGE ACHIEVEMENT  
SCORE ON I.Q.



## APPENDIX F

### REGRESSION EQUATION OF AVERAGE ACHIEVEMENT SCORE ON I.Q.

Average Achievement Score = Y  
I.Q. = X

$$\bar{Y} = 61.92 \quad SD = 13.25$$

$$\bar{X} = 87.15 \quad SD = 13.8$$

$$Y' = r_{xy} \frac{S_y}{S_x} (X - \bar{X}) + \bar{Y}$$

$$= .651 \left( \frac{13.8}{13.5} \right) (X - 87.2) + 61.92$$

$$= .677 (X - 87.2) + 61.92$$

$$= .677 X + 2.89$$

Standard error of prediction = 10.49946











